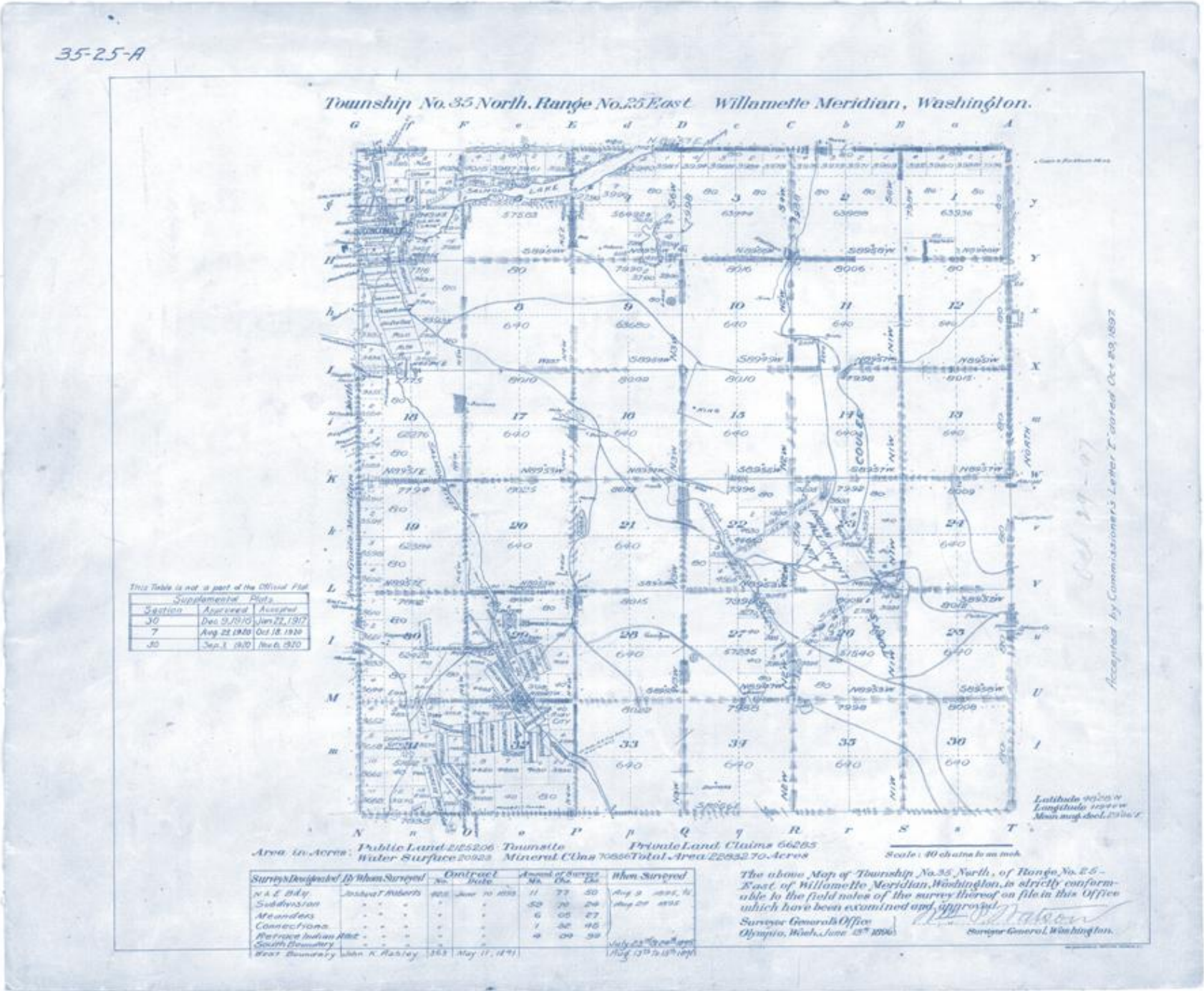


Washington Department of Natural Resources Land Survey Casebook.



WASHINGTON STATE DEPARTMENT OF
Natural Resources
Peter Goldmark - Commissioner of Public Lands

Presented at the 2010 LSAW Annual Conference
By Larry B. Pederson, PLS and Gary S. Herrick, PLS



Washington Department of Natural Resources Land Survey Casebook

A Collection of Interesting Land Surveys

1. Blue Lake – Fractional Section – South Line Never Measured, a May 2000 survey by James S. Engelhard
2. Mima Mounds – Multiple Retracements, an October 2002 survey by H. Thomas Laird
3. Sappho Access – Bearing Tree Problems, a June 1989 survey by Jon B. Purnell
4. Teeoff Survey – A Platting Blunder, a February 2009 survey by Gary S. Herrick
5. Mission Bearable – Center Quarter Corner Bamboozlement, a November 2008 survey by Kenneth A. Brown
6. Lost Creek – Cut and Run, a September 1997 survey by Daniel A. Wohl
7. Old Goat – Homestead Entry Survey Retracement, an April 2009 survey by Larry B. Pederson
8. Lestor Eaton Survey – Wheat Fields Near Dayton, a June 2008 survey by John M. Shackelford
9. Lone Ranch Survey – Maryland Lode, Unsurveyed and Unpatented, a May 2005 survey by Daniel A. Wohl
10. Empey Survey – Benson Syndicate Retracement, an October 1993 survey by Franklin T. Fischer
11. South Pass Road & Aspen Six – Closing Corners and Closing Sections, 2001 and 2009 surveys by Gary S. Herrick
12. Sutherland Ridge – Quarter Corner in Water, a 1998 survey by Jon B. Purnell
13. Smuggler Pass – Along the International Boundary, a 2002 survey by Gary S. Herrick
14. TEVOR Survey – Completion Survey Calculations, a 2009 survey by Gary S. Herrick

Blue Lake – Fractional Section – South Line Never Measured

Sec. 16, T24N, R27E, Willamette Meridian

In 1881 GLO surveyor Edson D. Briggs subdivided T24N, R27E.

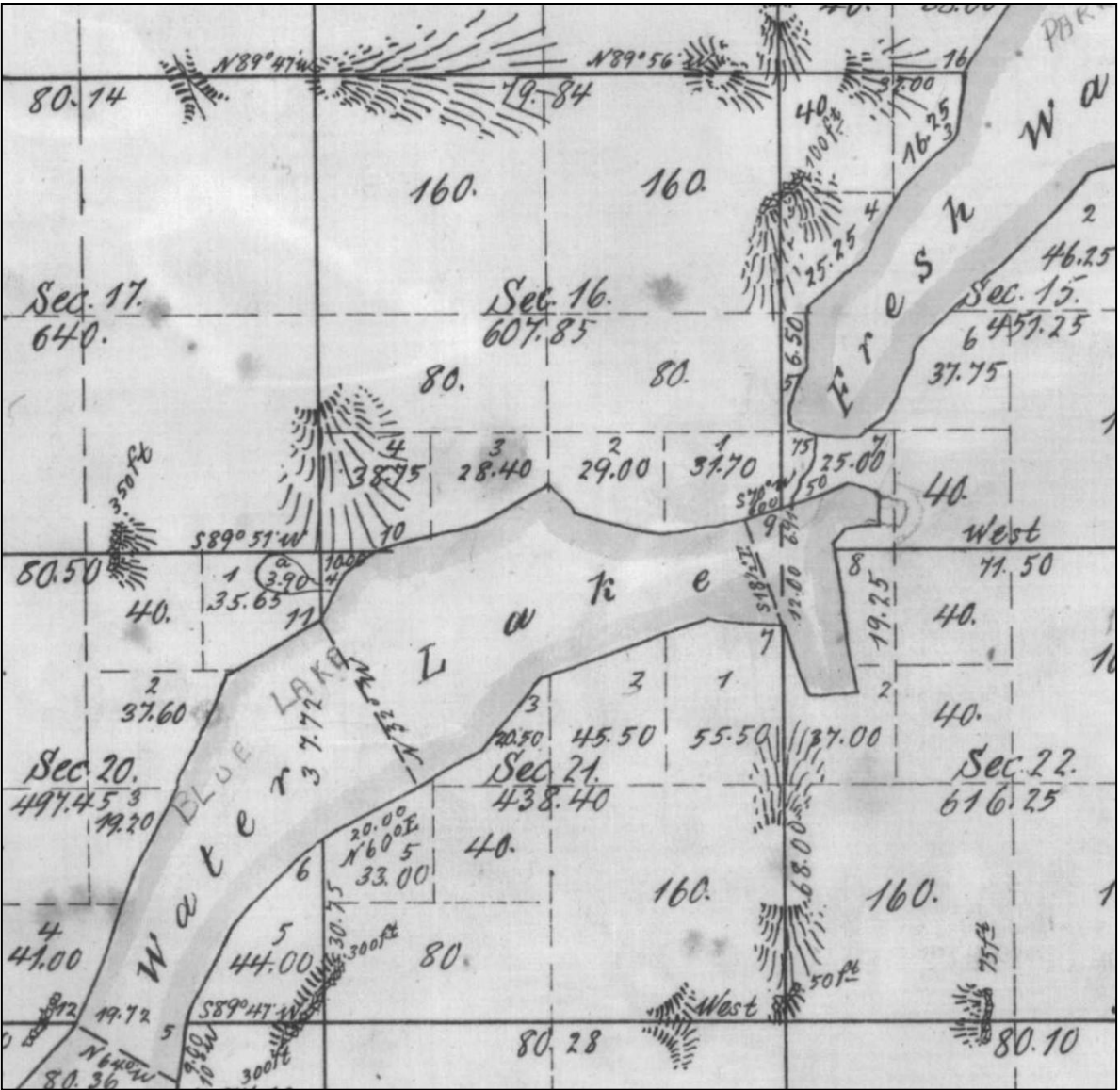
See the portion of the township plat on this page and the official field notes on the following two pages.

The location of the corner of sections 15, 16, 21, and 22 fell in a lake and was not established. Only the west 10 chains of the south line of section 16 was surveyed. The result is that there is no south quarter corner and no southeast corner for section 16, and there is no measured distance for the south line of section 16. The north-south centerline of fractional section 16 should be surveyed from the north quarter corner on a mean bearing of the east and west section lines. See section 3-88 of the BLM Manual on page 3. The center quarter section corner is at the intersection of the line between the east and west quarter corners and the north-south centerline. The south quarter corner cannot be located or calculated in the lake because there is no southeast section corner and no record measurement of the south section line. The center south 1/16 corner cannot be surveyed at a midpoint because there is no south quarter corner.

Possible solutions for surveying the center south 1/16 corner:

1. Place the corner on the north-south section centerline at 20 chains (1320 feet) south of the center quarter corner.
2. Place the corner on the north-south section centerline at a mean distance of the distances from the east and west quarter corners to the respective south 1/16 corners on the section lines.

Total number of Acres 21,306.63				
Surveys Designated	By Whom Surveyed	Date of Contract	Amount of Surveys	When Surveyed
Retracing 6 th Sub. Pl.	Edson D. Briggs	Spec. Ins. 23 rd June 1881 25 th Oct. 1880	6 M. 1 Ch. 90 Lk.	30 th June 1881
" " W. bdy.	" " "		5 70 29	29 th " "
Subdivisions	" " "		57 55 07	10 th July "
Meanders	" " "		14 37 50	
Intersections	" " "		15 05	



Blue Lake – Fractional Section – South Line Never Measured

Sec. 16, T24N, R27E, Willamette Meridian

North between secs. 21 + 22.
Var. 21° E.
4.00 Ascend ledge 50 ft high N.E. & S.W.
Ascend.
20.00 Summit of ascent N.N.E. + S.S.W.

30.00 Descend N. E. slope.
40.00 Set a stone $6 \times 8 \times 15$ in marked $\frac{1}{4}$ in a mound of rock 2 ft high 3 ft dia. for 14 sec. cor. 100 chs N. of edge of rock bluff. 200 ft high N and S & E. arm of grand Coulee.
67.50 Edge of rock bluff. 150 ft high S. side of grand Coulee S.E. & N.
68.00 Foot of bluff. S. shore of fresh water lake.
Set post $2 \times 2 \times 24$ in marked for cor. of fract. secs. 21 + 22. in a mound of rock 2 ft high + 3 ft dia.
Surface broken soil 3^d rate scattering sage brush.
The cor. of secs. 15-16-21+22. falls in a lake. I therefore run.
West bet secs. 15+22.
Var 22° E.

North between secs. 15+16
Var. 21° E.
To triangulate across lake
I cause flag. to be set. at
Cor.

of fract secs. 21+22.
being 12.00 chs. S. of sec. cor. in lake. From point on N shore of lake, N. of flag.
Run S. 70° W. 6.00 chs. where flag bears S. $18\frac{1}{2}^{\circ}$ E.
Distance across lake 18.91 chs.
6.91 North shore of lake. Set a post $2 \times 2 \times 24$ in. Marked for cor. of fract secs. 15+16. in mound of rock 2 ft high 3 ft dia.
38.50 Leave grand Coulee N.N.E. + S.S.W.
Ascend shell rock.
40.00 Set a stone $8 \times 8 \times 12$ in marked $\frac{1}{4}$ in a mound of rock 2 ft high 3 ft dia. for 14 sec. cor.
58.00 Top of perpendicular rock bluff 100 ft. high N. side. Grand Coulee N.N.E. + S.S.W.
80.00 Deposited, pit Charcoal 1 ft deep and raised earth mound 2 ft high, with 4 pits 12×24 in 1 ft deep
Post $2 \times 2 \times 24$ inches in S.E. pit 1 ft deep. marked for corner of sections 9-10-15+16.

Blue Lake – Fractional Section – South Line Never Measured

Sec. 16, T24N, R27E, Willamette Meridian

80.00	Set a post 2x2x24 in. marked for cor. of Secs. 16-17-20+21 in a mound of rock 2ft high and 3ft dia. Surface broken. Soil 3' rate scattering sage brush. The line bet secs. 16 and 21 will strike the lake in less than 80.00 chs. I therefore run it. East bet Secs. 16 + 21 Var. 21° E. 10.00 West shore of lake. Set stone 8x12x18 in. marked for Cor. of frach. Secs. 16 + 21. in a. mound of rock 2ft high and 3ft dia. Surface steepest S.E. rocky no soil.
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Section 3-88 of the *Manual of Instructions for the Survey of the Public Lands of the United States 1973*

Subdivisions of Fractional Sections

3-88. The law provides that where opposite corresponding quarter-section corners have not been or cannot be fixed, the subdivision-of-sec-

tion lines shall be ascertained by running from the established corners north, south, east, or west, as the case may be, to the water course, reservation line, or other boundary of such fractional section, as represented upon the official plat.

In this the law presumes that the section lines are due north and south, or east and west lines, but usually this is not the case. Hence, in order to carry out the spirit of the law, it will be necessary in running the center lines through fractional sections to adopt mean courses where the section lines are not on due cardinal, or to run parallel to the east, south, west, or north boundary of the section, as conditions may require, where there is no opposite section line.

Blue Lake – Fractional Section – South Line Never Measured

Sec. 16, T24N, R27E, Willamette Meridian

The east section line is considerably short of record distance, and the east quarter corner is lost and has been restored by proportionate measurement. As a result, placing the center south 1/16 corner at 20 chains south of the center quarter corner would distort the section and create an inequitable distribution of acreages among the lots and quarter-quarter sections. It was felt that a mean distance of the east and west section lines would most equitably distribute the deficiencies in distance and acreage. See the survey narrative below. Note that this survey used a weighted mean bearing, which is currently the preferred type of mean bearing.

NARRATIVE:

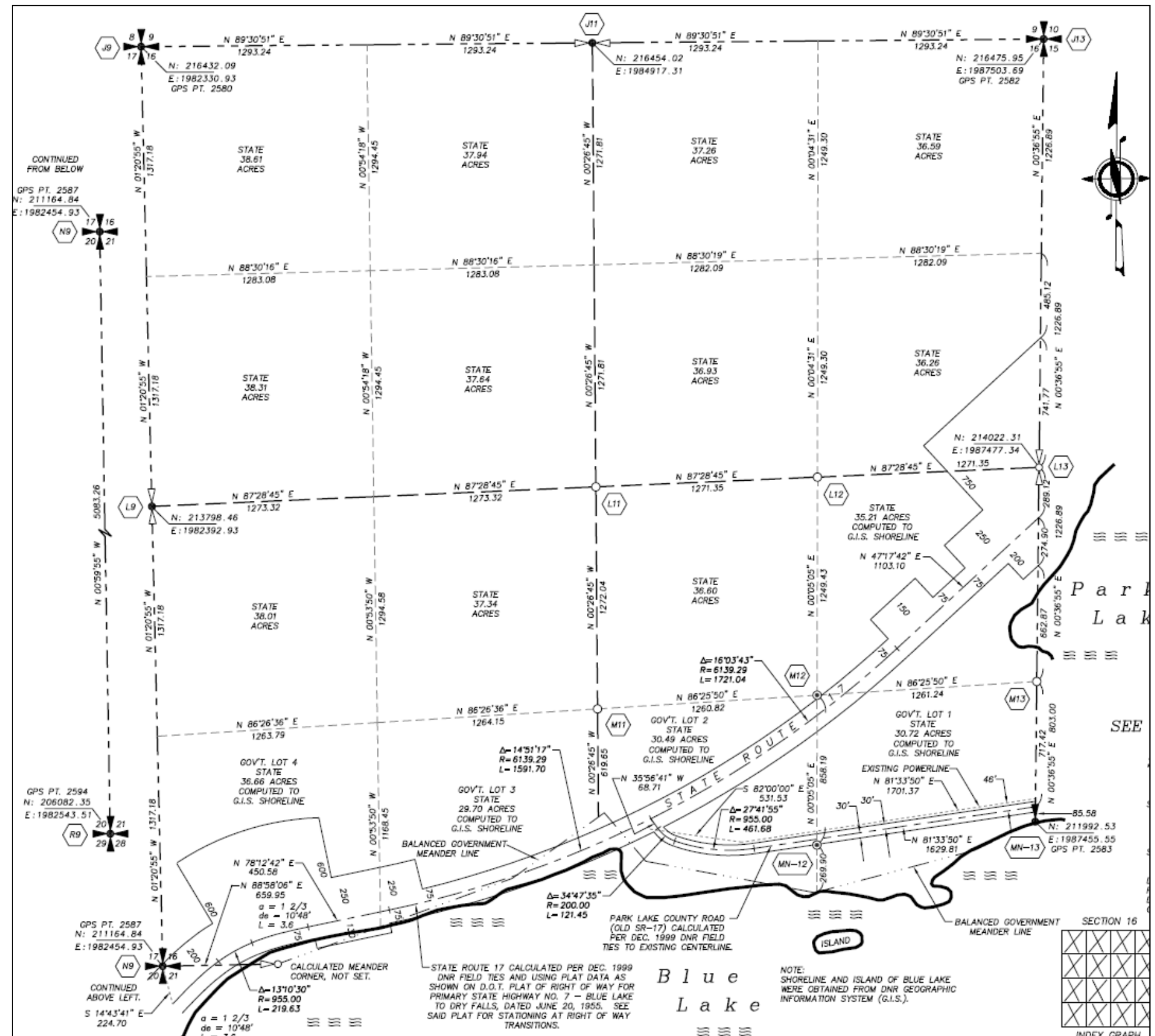
THE PURPOSE OF THIS SURVEY IS TO DETERMINE THE EAST LINE OF SECTION 16 AND TO DETERMINE THE BOUNDARY BETWEEN GOVERNMENT LOTS 1 AND 2 IN SECTION 16.

C. 1989 FRED SKINNER, PLS, FOUND A MOUND OF STONE AT THE TOP OF THE GRAND COULEE ON THE SOUTH SIDE OF BLUE LAKE BETWEEN SECTIONS 21 AND 22. ALTHOUGH THIS POSITION IS WEST OF THE STRAIGHT LINE SINGLE PROPORTION BETWEEN THE NORTHEAST CORNER OF SECTION 16 AND THE SOUTHEAST CORNER OF SECTION 21, THIS POSITION IS BELIEVED TO BE THE BEST AVAILABLE EVIDENCE OF THIS LINE. THE GLO CALLS THE TOP OF THE BLUFF AT 67.50 CHAINS FROM THE SOUTHEAST CORNER OF SECTION 21, BUT THAT DISTANCE MEASURED ALONG THE SINGLE PROPORTION LINE WOULD FALL IN JASPER CANYON TO THE EAST. THIS POSITION WAS AGREED TO IN PRINCIPLE BY THE DEPARTMENT OF NATURAL RESOURCES, WESTERN PACIFIC ENGINEERING (FRED SKINNER, PLS), ERLANDSEN AND ASSOCIATES (DAN BEARDSLEE, PLS), AND STIRLING KNUDSEN, PLS. THE LATTER TWO FIRMS HAVE PENDING SURVEYS IN SECTION 15.

FRED SKINNER SET A REBAR AND CAP ON THE NORTH SIDE OF BLUE LAKE ON LINE WITH THIS FOUND MOUND OF STONE AND THIS POSITION WAS HELD AS THE MEANDER CORNER BETWEEN SECTIONS 15 AND 16.

SECTION 16 IS A FRACTIONAL SECTION WITH THE SOUTH 1/4 CORNER NEVER HAVING BEEN DETERMINED. THE BEARING OF THE NORTH-SOUTH CENTER 1/4 LINE WAS DETERMINED BY A WEIGHTED MEAN BEARING OF THE EAST AND WEST LINES OF SECTION 16. THE BEARING OF FURTHER FRACTIONAL SUBDIVISION LINES WAS DETERMINED BY SIMPLE MEAN OF THE BEARINGS OF THE LINES EAST AND WEST OF THE SUBJECT LINE.

THE POSITION OF THE CENTER-SOUTH 1/16 CORNER, WHICH WOULD NORMALLY BE PLACED AT RECORD DISTANCE (1320 FEET) SOUTH OF THE CENTER 1/4 CORNER, WAS PLACED INSTEAD AT THE MEAN OF THE DISTANCES OF THE RESPECTIVE 1/4 MILE DISTANCES ON THE EAST AND WEST SECTION LINES. THIS WAS DONE BECAUSE OF THE SHORTNESS OF THE EAST SECTION LINE RELATIVE TO THE WEST SECTION LINE, AND RESULTS IN THE LOT ACREAGE BEING MORE PROPORTIONAL TO THE RECORD.



Mima Mounds – Multiple Retracement

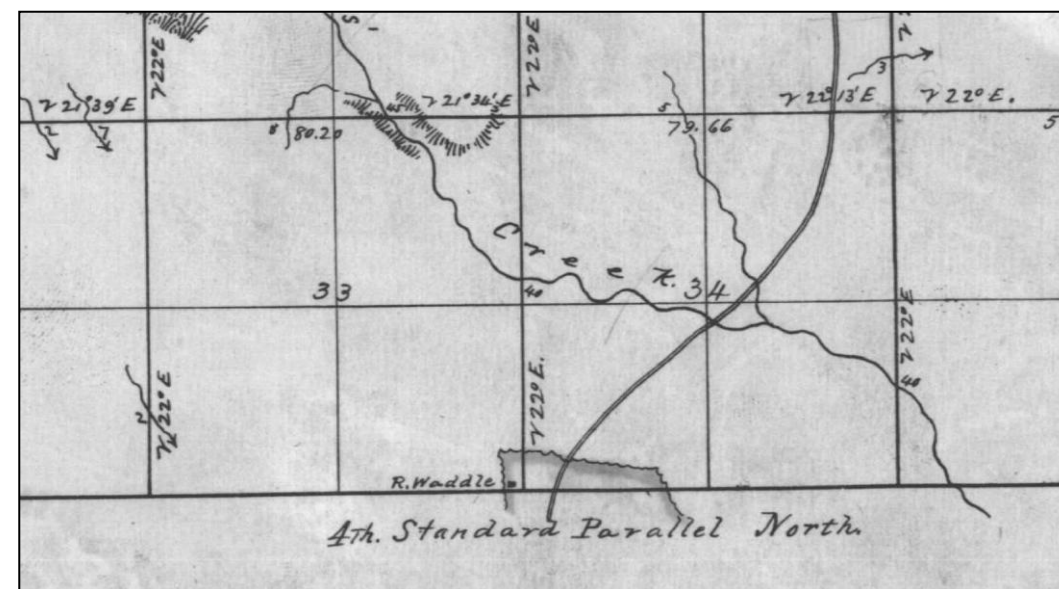
Sec. 33 & 34, T17N, R3W, Willamette Meridian

History of Surveys:

1855: GLO Surveyors G. C. and C. T. Gardner surveyed the 4th Standard Parallel North and subdivided T16N, R3W. They set closing section and quarter corners during a retracement of the standard parallel. The closing corner of sections 3 and 4 was set 75 links west of the standard corner of sections 33 and 34, and the closing north quarter corner of section 3 was also set 75 links west of the standard quarter corner.



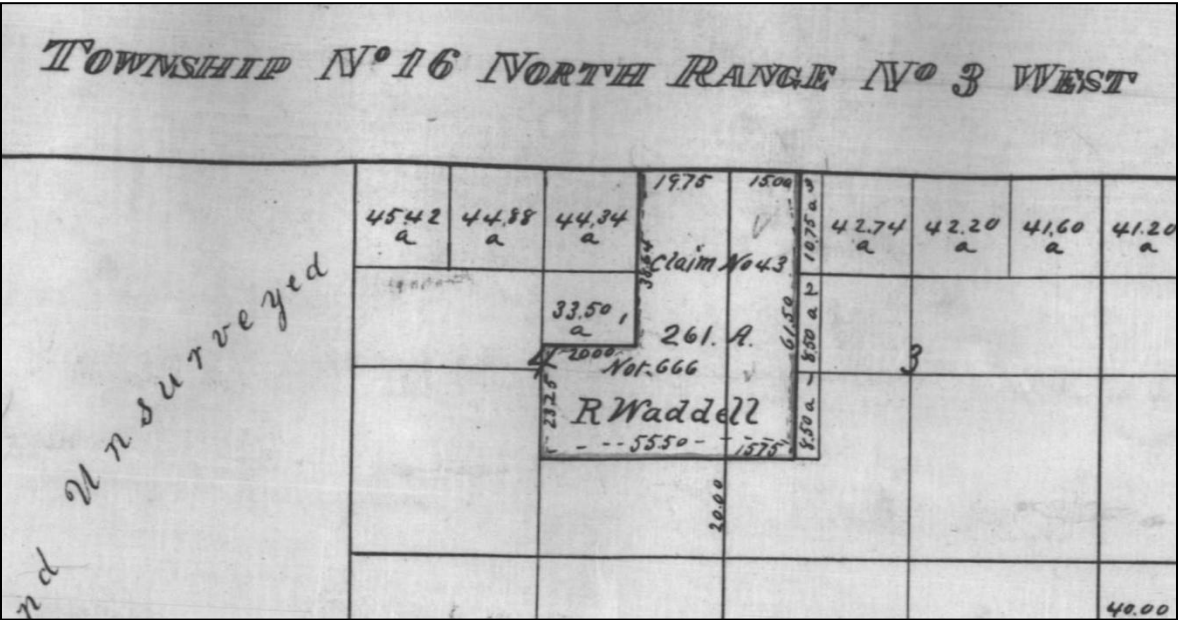
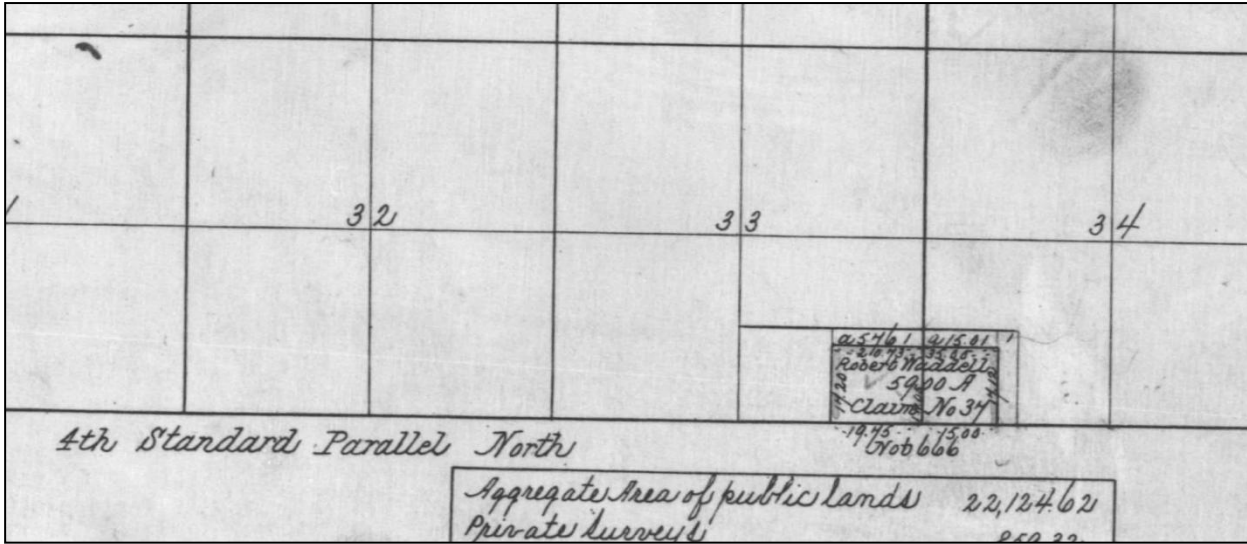
1856: GLO Surveyor Thomas F. Berry subdivided T17N, R3W, surveying the line between sections 33 and 34.



Mima Mounds – Multiple Retracement

Sec. 33 & 34, T17N, R3W, Willamette Meridian

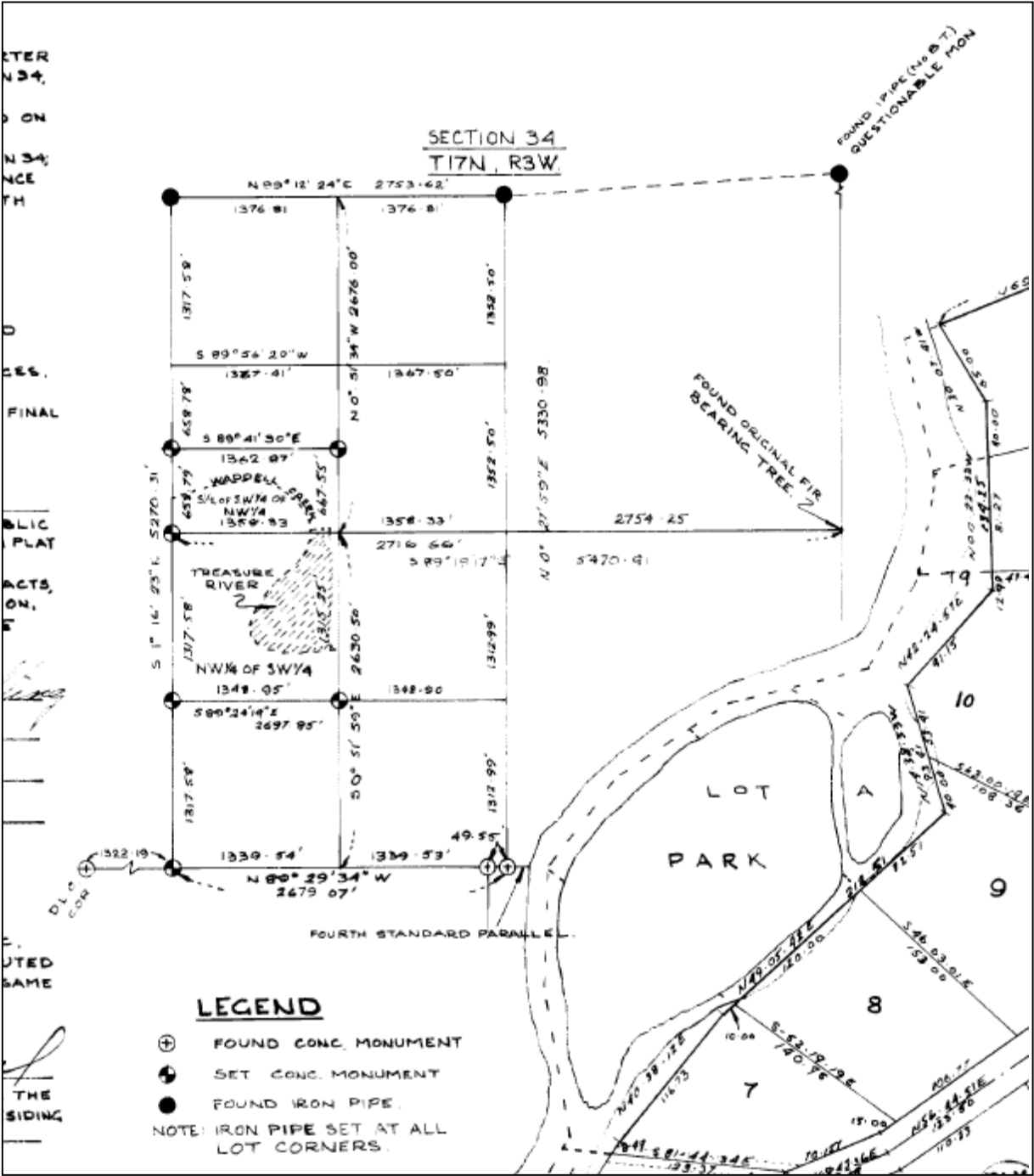
1857: T. F. Berry surveyed the Robert Waddell Donation Land Claim, being claim 37 in T17N, R3W and claim 43 in T16N, R3W.



Mima Mounds – Multiple Retracement

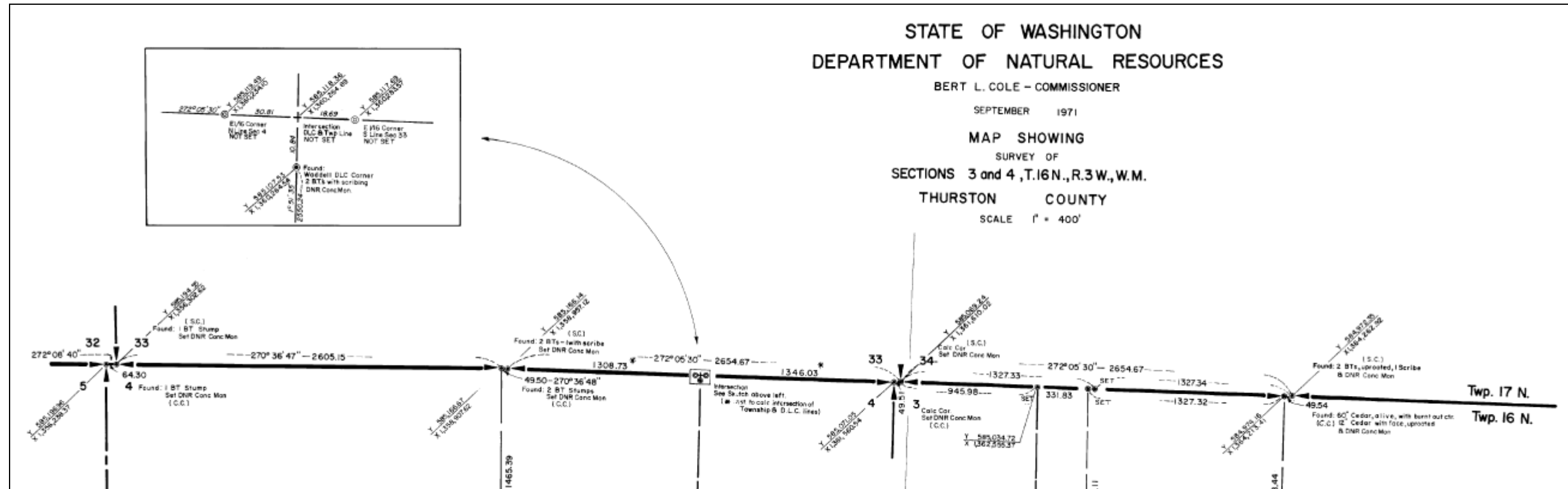
Sec. 33 & 34, T17N, R3W, Willamette Meridian

1963: L. C. Cantor, PLS 8125, in the course of surveying plat of Treasure River in section 34 restored the lost standard corner of sections 33 and 34 and the lost quarter corner of sections 33 and 34 by proportionate measurement. The standard corner was established using found monuments at the south quarter corner of section 34, at the north quarter corner of section section 3 and at the westerly corner of the Waddell DLC set on the standard parallel. The restored standard section corner seems not to be quite at the proper proportionate distance. One might question the use of the DLC closing corner to proportion the standard section corner. Cantor also set a monument at the south sixteenth corner on the section line.



Sec. 33 & 34, T17N, R3W, Willamette Meridian

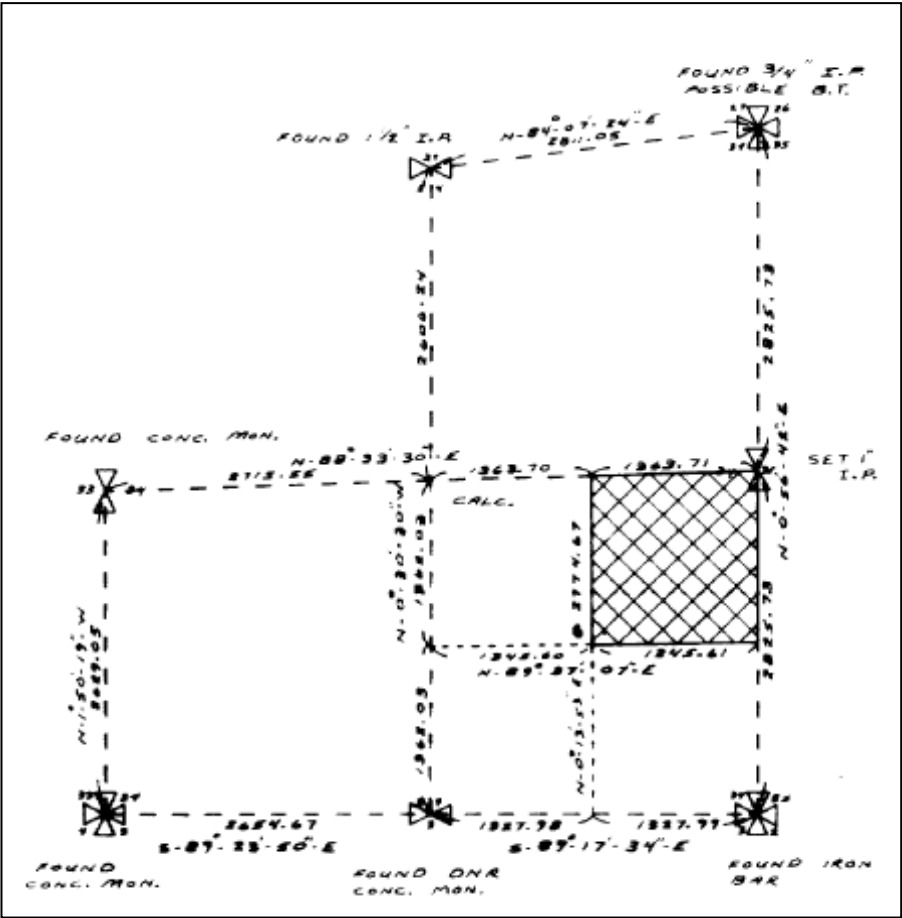
1971: DNR retraced the standard parallel. Cantor's standard corner of sections 33 and 34 was tied but not accepted. Its location was not shown on the survey map. A new standard corner was proportioned, as was the closing corner of sections 3 and 4. The standard south quarter corners of sections 33 and 34 were used to control the proportioning of the lost section corners. The Cantor standard corner was found S 73° 41' W, 24.63 feet from the new DNR standard corner.



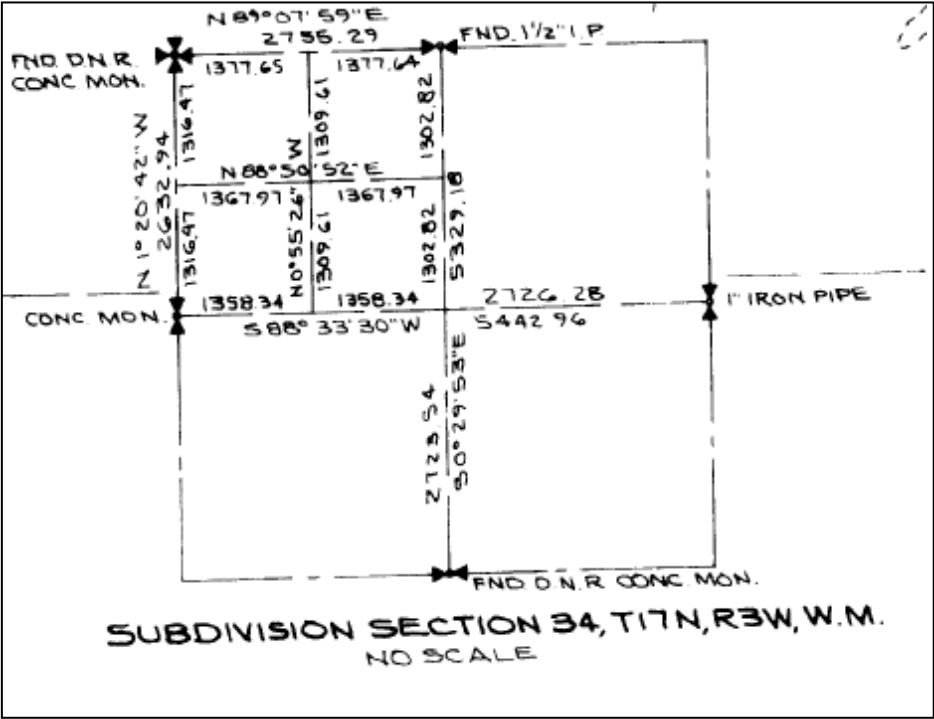
Mima Mounds – Multiple Retracements

Sec. 33 & 34, T17N, R3W, Willamette Meridian

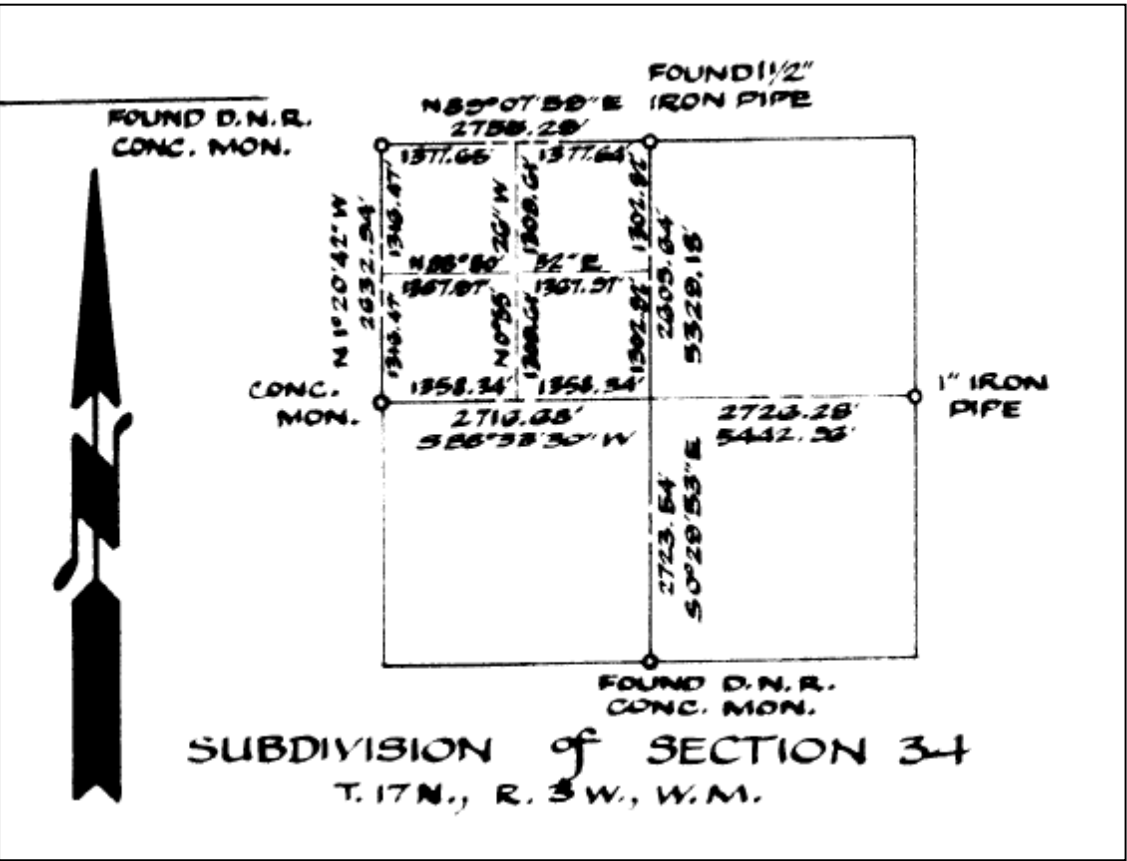
1977: Evan Ertman, PLS 12610, accepted the Cantor quarter corner of sections 33 and 34 and accepted a concrete monument at the standard corner of sections 33 and 34. The distance to the section corner is the same as on the DNR 1971 survey, which leads to the conclusion that he accepted the DNR concrete monument and not the Cantor concrete monument.



1983: Gareth Johnson, PLS 11019, accepted the Cantor quarter corner of sections 33 and 34 in the course of surveying land in the northwest quarter of section 34.

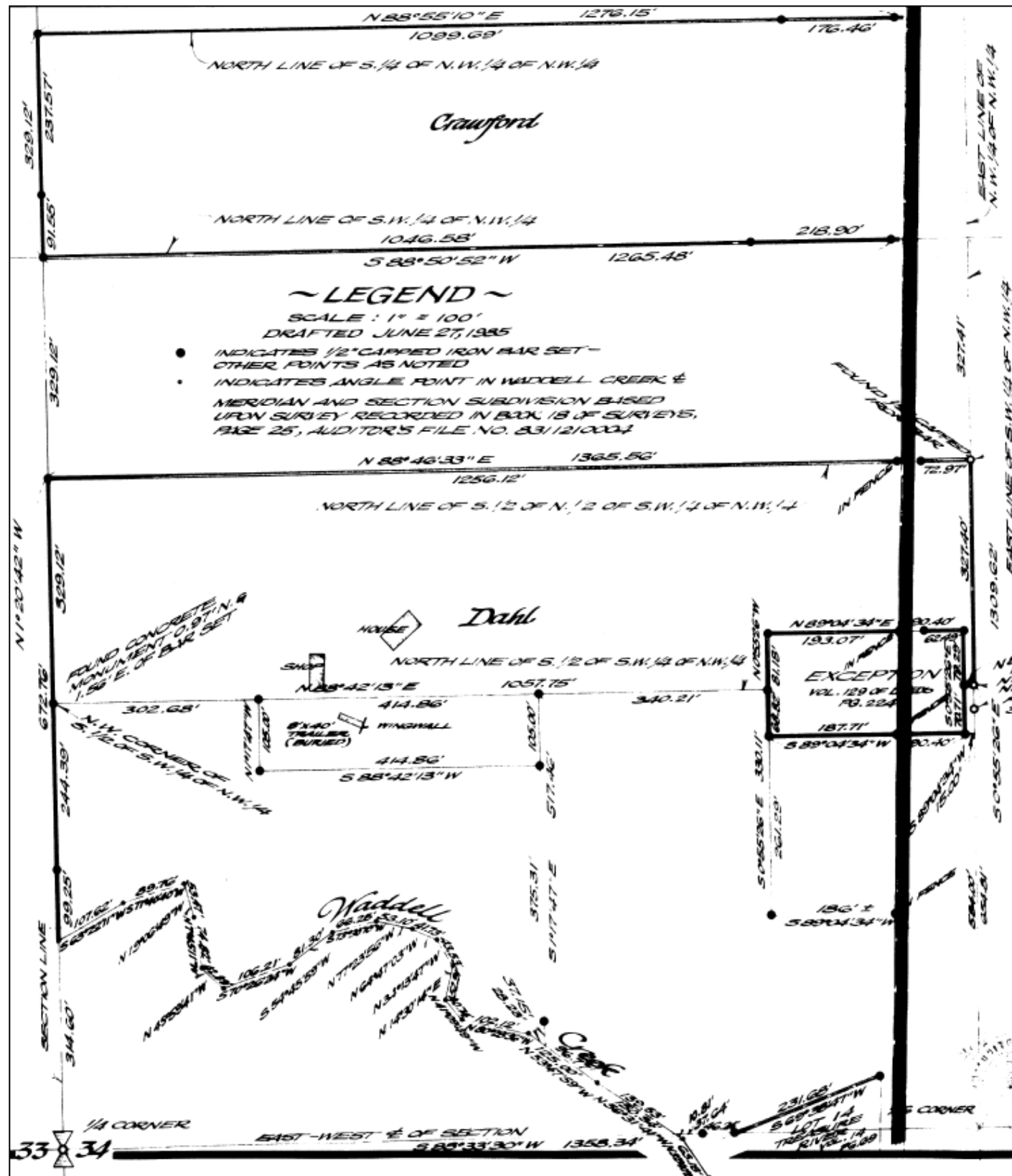


1985: William Johnson, PLS 9397, accepted the Cantor quarter corner of sections 33 and 34 in the course of surveying land in the northwest quarter of section 34.



Sec. 33 & 34, T17N, R3W, Willamette Meridian

1986: Tim Bates, PLS 10711, accepted the Cantor quarter corner and the DNR standard section corner.

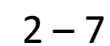


Sec. 33 & 34, T17N, R3W, Willamette Meridian

The effects of the DNR survey were to upset the subdivisions of section 34 which were based on the Cantor quarter corner monument and to point out that many landowners were trespassing on State land in section 33.

ACCEPTED CORNER
FD: 28" FIR BT STUMP WITH VISIBLE SCRIBE AT
S86W, 22.4 FEET, MEASURED FROM THE GLO
CHAINING NOTCH JUST BELOW SCRIBE. ALSO FOUND
BURNED WOOD REMAINS OF THE ORIGINAL POST TO
A DEPTH OF 18 INCHES. A CONCRETE MONUMENT
WITH BRASS CAP, SET BY L.C. CANTOR IN 1962 AT
A CALCULATED POSITION BEARS S75°08'12"W,
57.84 FEET, NOT ACCEPTED.
ON 2-18-92, THIS SURVEY SET A DNR ALUMINUM
MONUMENT WITH STAMPED ALUM CAP AT N86E, 22.4
FEET FROM THE FOUND BT, AT THE LOCATION OF THE
REMAINS OF THE ORIGINAL POST. THE FOLLOWING
REFERENCES WERE NOTED:
4 RP'S
DNR CARSONITE WITNESS POST AT NORTH, 2 FEET.
21" HEMLOCK AT N38E 5.76 FEET TO ALUM NAIL
IN SE SIDE.
13" CEDAR AT S55E 8.88 FEET TO ALUM NAIL IN
SW SIDE.
6" FIR AT S73W 24.45 FEET TO ALUM NAIL IN
NORTH SIDE.
FB 585.62 PAGE 33

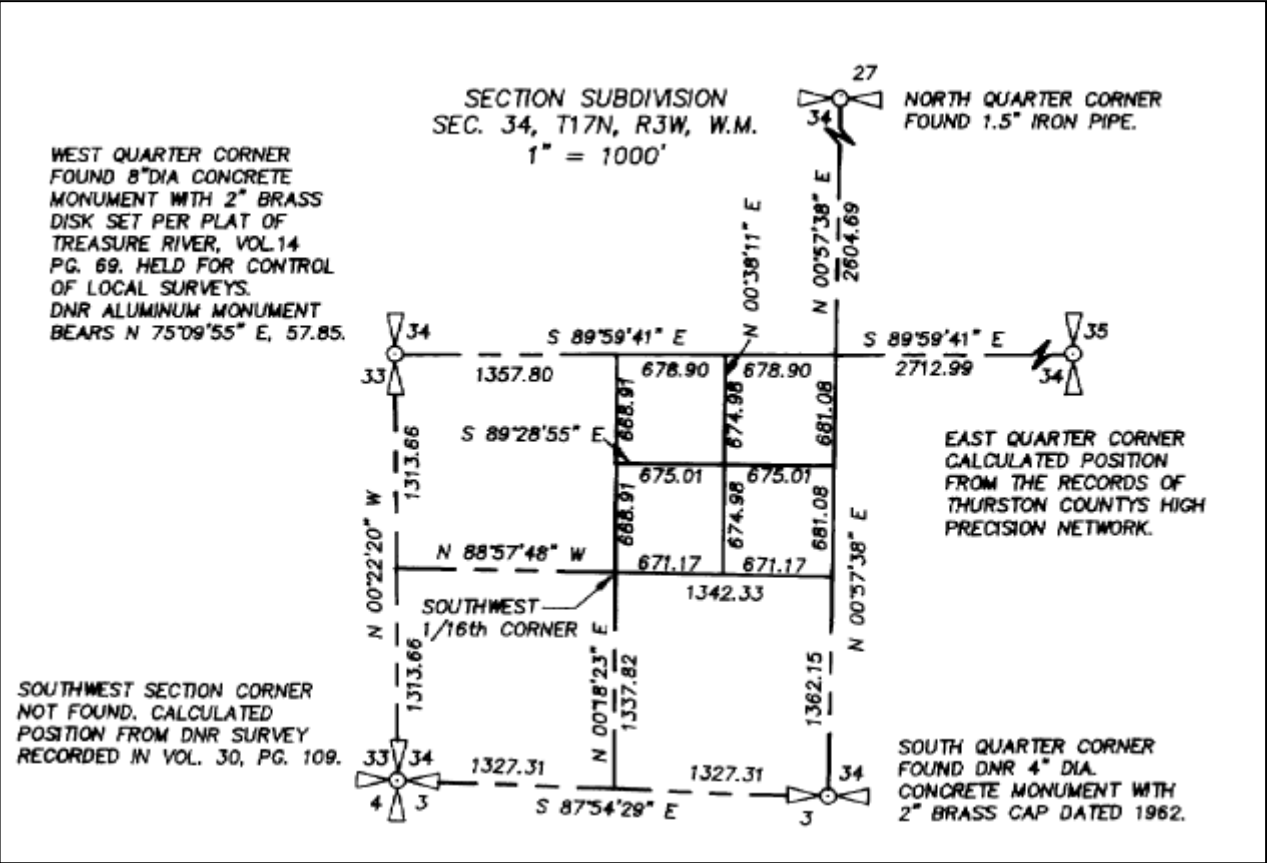
ACCEPTED CORNER
THE MONUMENT MARKING THE POSITION OF THE CORNER
HAS BEEN DESTROYED BY LAND CLEARING OPERATIONS.
THIS SURVEY ACCEPTS THE COORDINATE VALUE SHOWN
ON DNR FINAL MAP 129-C, WHICH IS ON FILE AT THE
STATE LAND SURVEY UNIT IN OLYMPIA.



Mima Mounds – Multiple Retracement

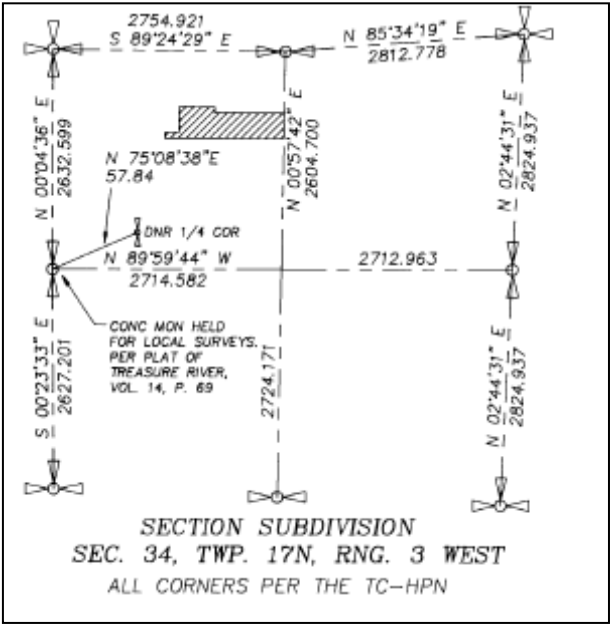
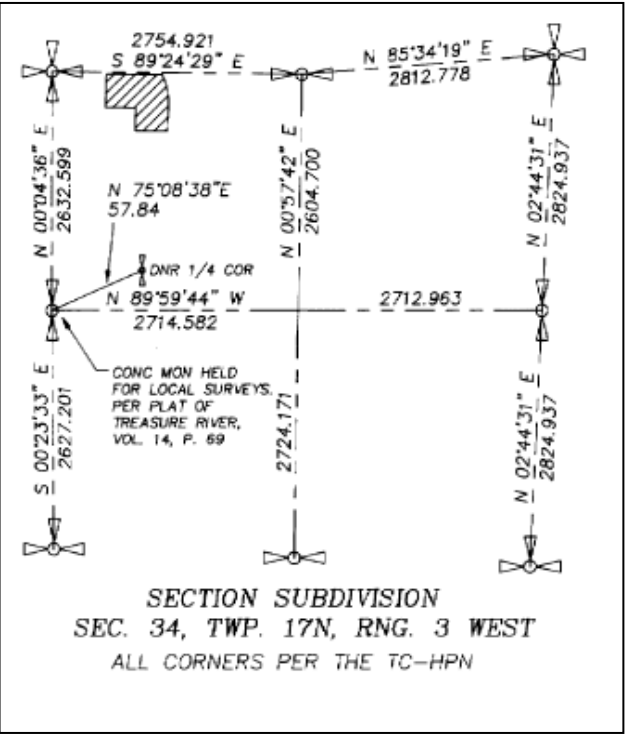
Sec. 33 & 34, T17N, R3W, Willamette Meridian

1996: Craig Hansen, PLS 27134, accepts the Cantor quarter corner, not the DNR monument marking the GLO quarter corner position.



1996: John Swift, PLS 6122, in two surveys in the northwest quarter of section 34, rejects the DNR quarter corner of sections 33 and 34 and accepts the Cantor monument.

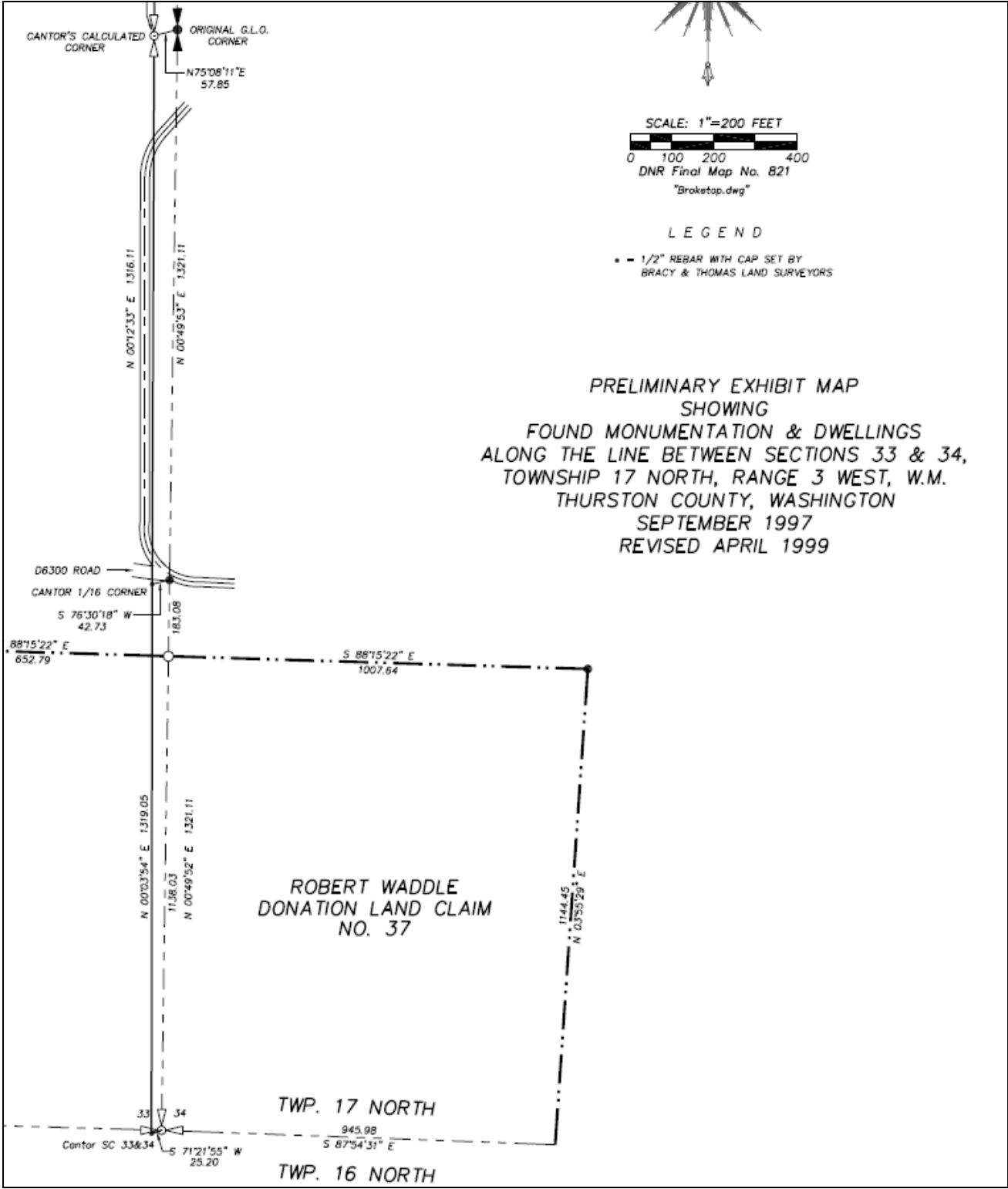
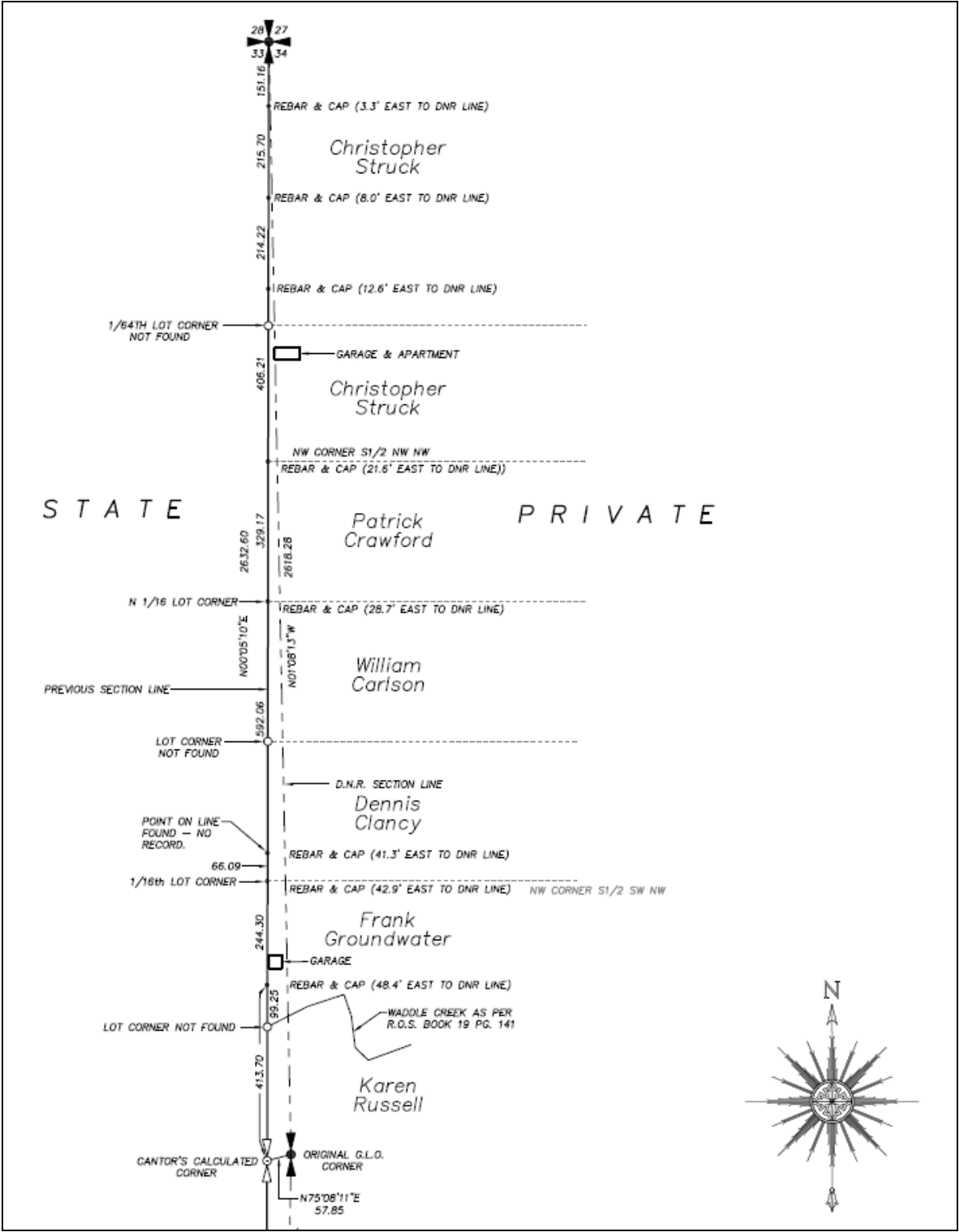
1997: John Swift, in a survey in the southwest quarter of section 34, again rejects the DNR monument at the quarter corner. That survey is not shown here.



Mima Mounds – Multiple Retracementments

Sec. 33 & 34, T17N, R3W, Willamette Meridian

1997 and 1999: DNR prepared an exhibit map showing the difference between the section line as defined by the three Cantor monuments for the quarter corner, the south sixteenth corner, and the standard section corner, and the section line as defined by the DNR monuments. In both cases a DNR monument is accepted as the northwest corner of section 34.



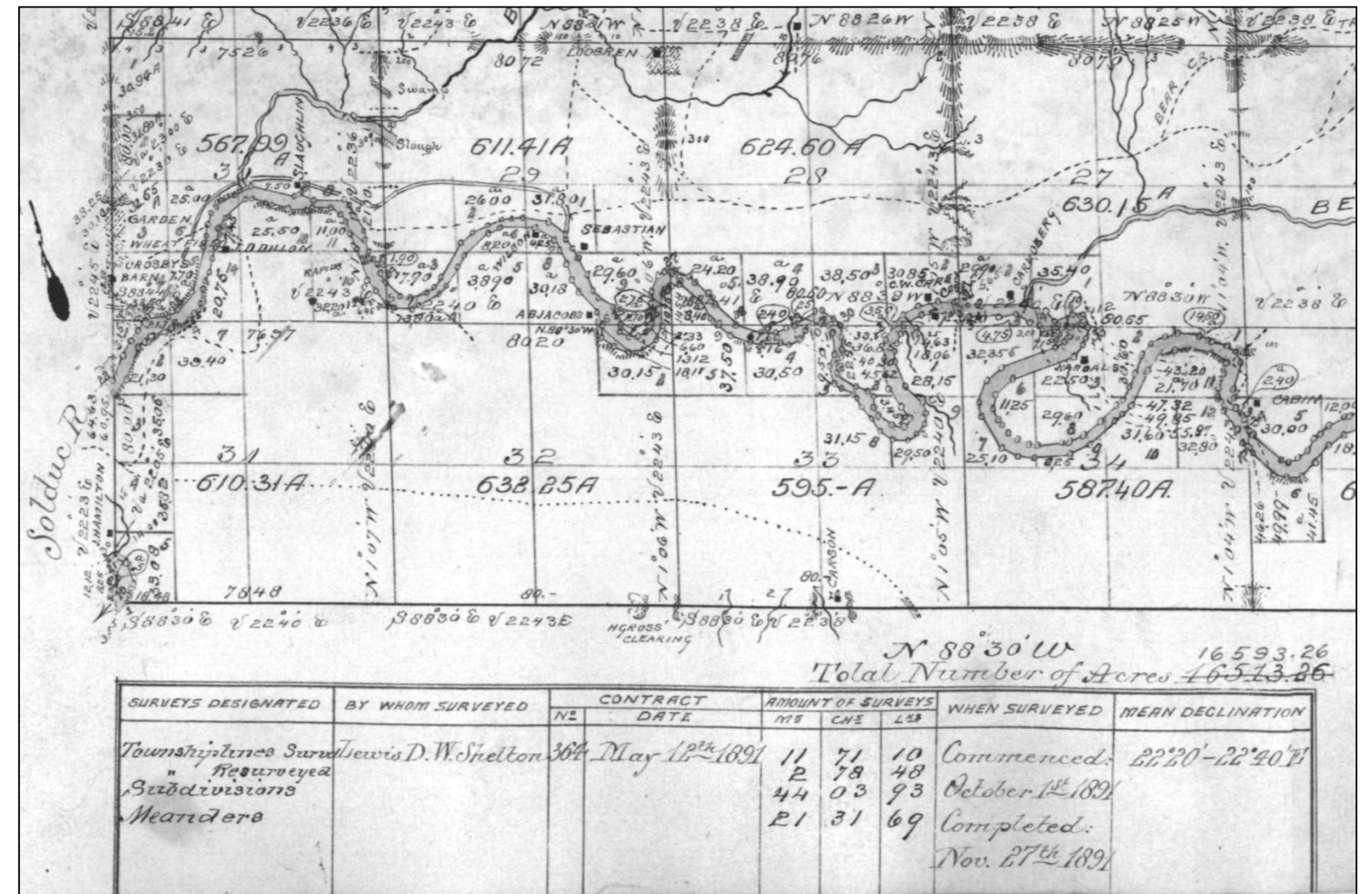
Sec. 33 & 34, T17N, R3W, Willamette Meridian

2 – 10

Sappho Access – Bearing Tree Problems

Sec. 30, T30N, R12W, Willamette Meridian

In 1891 GLO surveyor Lewis D. W. Shelton subdivided T30N, R12W, establishing the quarter section corner of sections 30 and 31 at 40 chains westerly of the southeast corner of section 30 and at 36.97 chains easterly of the southwest corner of section 30. See the field notes on the next page.



Sappho Access – Bearing Tree Problems

Sec. 30, T30N, R12W, Willamette Meridian

N. 88° 30' W. on a random line between
Secs. 30 and 31.
Var. 22° 43' E.

- 40.00 Set temporary 1/4 sec. cor.
76.97 Intersect West Boundary of the Township
32 lks. North of cor. to secs. 25, 30, 31 & 36,
Phenee Run.
At 10 A.M. diurnal change has decreased
the Var. 2'
S. 85° 44' E. on a true line between
secs 30 and 31,
Var. 22° 41' E.

Land nearly level prairie

- 5.00 Leave prairie bear N. E. & W. and enter
heavy timber
8.00 Set an alder post 4 ft. long, 4 ins. sq.
24 ins. in the ground on Right bank of
Soldue River, for meander cor. to final
secs. 30 and 31 marked
N. 6. on E. face with
P. 30 N. on W.
R. 12 W. S. 30 on N. and
S. 31 on S. faces. from which
an alder 6 ins. diam. bears N. 4° W. 24 1/2
lks. dist. marked P. 30 N. R. 12 W. S. 30 & 31.
An alder 5 ins. diam. bears S. 18° W. 24 1/2 lks.
dist. marked P. 30 N. R. 12 W. S. 31 & 30.
Set a flag on right bank of river at
meander corner and crossed over on
line to left bank. run South 100 lks.

for base. flag on right bank at meander
corner bears N. 85° 50' W. making distance
across the river. 13.72 chs.

- 21.72 Left bank of river.
Set a hemlock post 4 ft. long, 4 ins. sq.
24 ins. in the ground for meander cor. to
final secs. 30 and 31 marked
N. 6. on W. face with
P. 30 N. on E.
R. 12 W. S. 30 on N. and
S. 31 on S. faces. from which
a fir 50 ins. diam. bears N. 81° E. 24 lks. dist.
marked P. 30 N. R. 12 W. S. 30. N. 6. O. P.
a hemlock 9 ins. diam. bears S. 34° 45' W. 26 1/2 lks. dist.
marked P. 30 N. R. 12 W. S. 31. N. 6. O. P.
22.50 Trail bears N. E. and S. W.
36.97 Set a hemlock post 4 ft. long, 4 ins. sq. 24
ins. in the ground for 1/4 sec. cor. marked
1/4 S. on N. face. from which.
a fir 60 ins. diam. bears S. 13° E. 14 1/2 lks. dist.
marked 1/4 S. O. P.
a fir 40 ins. diam. bears N. 18° E. 21 lks. dist.
marked 1/4 S. O. P.
41.93 Trail bears N. & S.
76.97 The cor. to secs. 29, 30, 31 and 32.

Sappho Access – Bearing Tree Problems

Sec. 30, T30N, R12W, Willamette Meridian

In 1981 DNR filed a Land Corner Record monumenting the quarter section corner of sections 30 and 31. It was noted that the upper and lower faces of both bearing trees had been chopped out.

RES 20-1808(9-77)

522704
STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
BUREAU OF SURVEYS AND MAPS
LAND CORNER RECORD

T 30 N, R 12 W, W.M. Segregated Surveys: Name: Corner Code No. V-3
CLALLAM County
DLC, HES, Tract, Mining Claim, Indian Allotment, Federal Reserve, Townsite.

1. History of Corner Establishment and Subsequent Restoration:
Hemlock post set for corner by GLO in 1891.
Fir 60", S 13° E, 14½ lks. (9.57')
Fir 40", N 18° E, 21 lks. (13.86')

2. Description of Evidence Found:
2 Douglas fir stumps with chopped out remains of upper and lower faces. Possible error by GLO in returning distance to SE BT but bearings fit along with ties to river and plotted position of east one quarter corner of Section 31(30-12) when the 2 corners are aligned on paper.

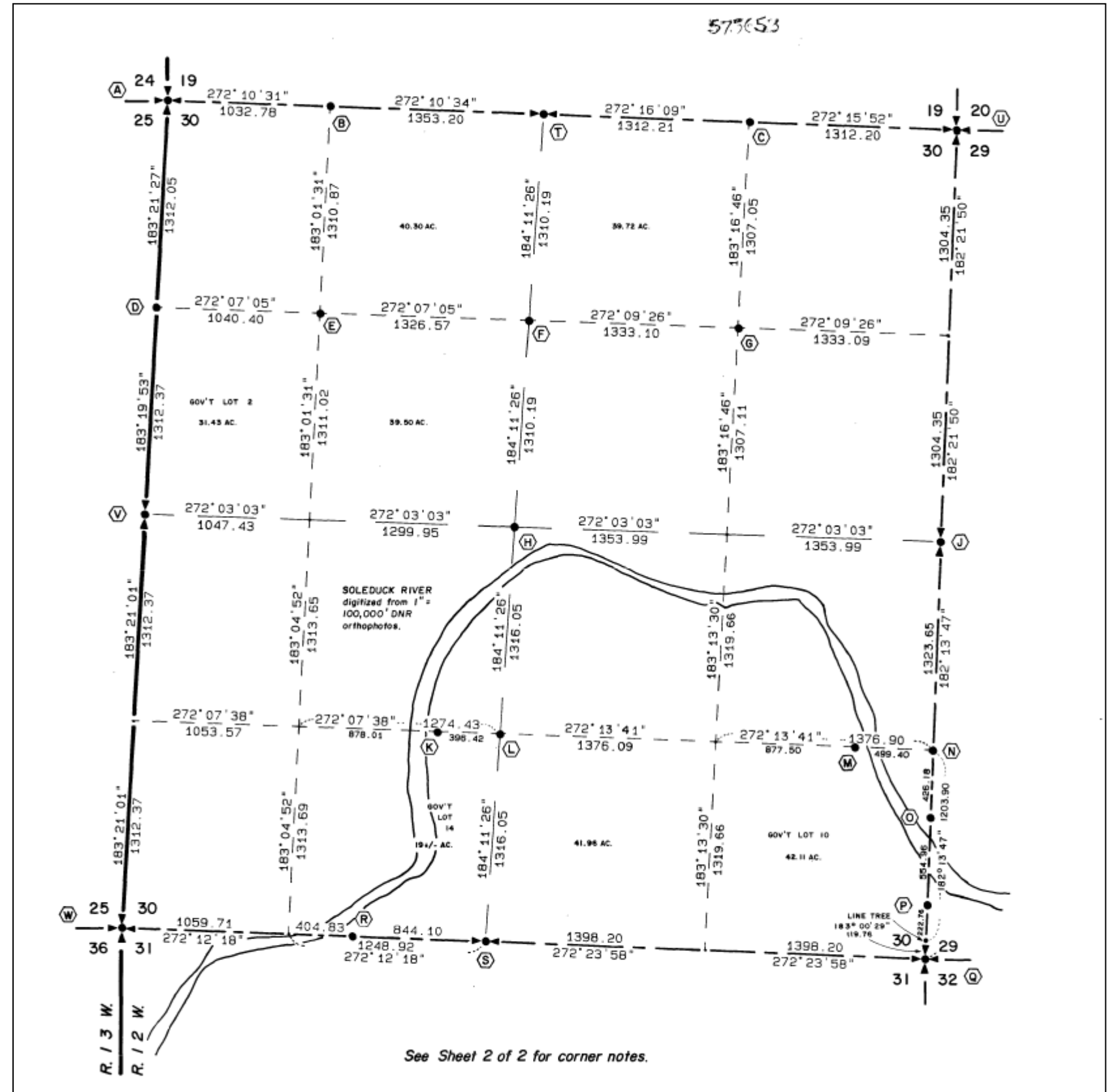
3. Describe Monument, Accessories and Corollary Data to Perpetuate this Corner Location. Diagram corner and indicate meridian and reference to map of record. Surveyor's Field Book No. Page No. Date of work 7/23/81
I set standard DNR 3" cylindrical concrete monument with brass cap and proper corner identification from which bears;
68" Douglas fir stump, BT tag, chopped out upper and lower faces, S 11° E, 11.45' to face.
42" Douglas fir stump, BT tag, chopped out upper and lower faces, N 18° E, 13.86' to face.
RP 22" Douglas fir, alive, tag, S 70½° W, 7.87' to nail.
RP 16" Hemlock, alive, tag, N 86½° E, 14.13' to nail.
T 30 N R 12 W
S.30
1/4 S.31
1981

Sappho Access – Bearing Tree Problems

Sec. 30, T30N, R12W, Willamette Meridian

In 1985 DNR surveyed section 30 using the monument for the quarter corner that had been established in 1981. Note that the DNR found the distance to the southwest corner of section 30 to be 2308.63 feet. The GLO returned a distance of 36.97 chains or 2440.02 feet.

S
FD: DNR CONCRETE MONUMENT WITH STAMPED BRASS CAP AS SET BY DAN KOUSBAUGH, P.L.S. #11983 ON 23 JULY 1981 AS REFERENCED ON LAND CORNER RECORD FILED UNDER A.F. #522704.
49" FIR B.T. STUMP WITH CHOPPED FACE AT N.18 E., 13.86 FT.
66" FIR B.T. STUMP WITH FACE AT S.11 E., 11.45 FT.
BOTH FOUND B.T.'S. HAVE B.T. TAGS PLACED ON THEM BY MR. KOUSBAUGH.
HELD FOUND DNR MONUMENT FOR CORNER.
3 RP'S.:
18" HEMLOCK AT N.86 E., 14.09'
15" FIR AT S.2 E., 6.22'
24" FIR AT N.70 W., 7.86'
F.B. 569.18D P.53
F.B. 569.18E P.54



Sappho Access – Bearing Tree Problems

Sec. 30, T30N, R12W, Willamette Meridian

In 1897 R. H. Thompson, County Surveyor, found the quarter corner of sections 30 and 31 to be 37.82 chains or 2496.12 feet from the southwest corner of section 30. Compare that distance to the GLO record and to the distance measured by the DNR 1985 survey. The county survey did not describe the corner monument. In 1988 a private surveyor found a scribed bearing tree some distance east of the DNR monument. DNR found that there had been an examination survey of Shelton's original survey and obtained a copy of the examination survey field notes. The notes for the line between sections 30 and 31 are on the following page. Note the differences between the bearing trees noted on the examination survey and the original Shelton survey.

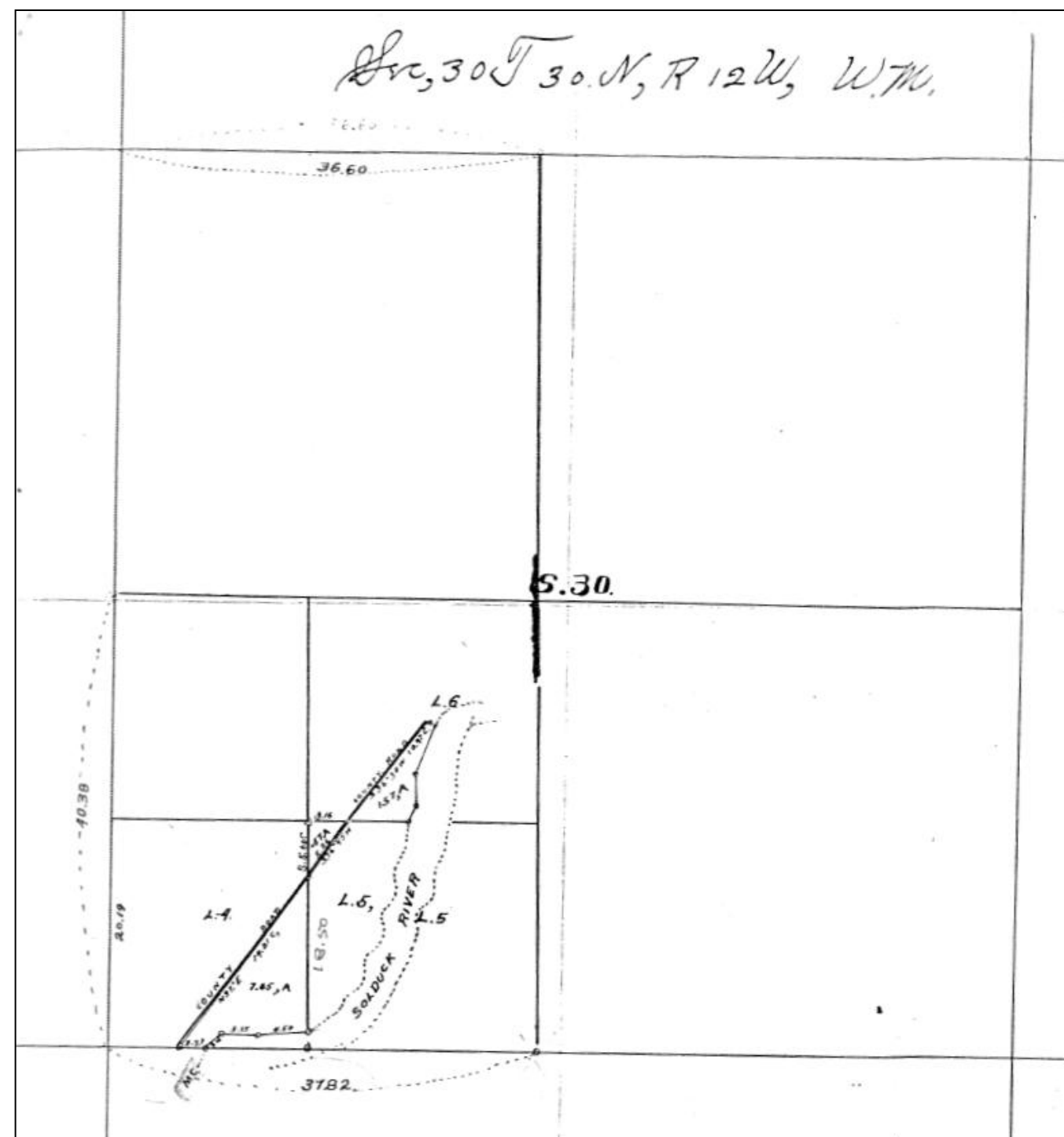
Surveyed by R. H. Thompson
County Surveyor.
April 20th 1897

Field notes of the
Examination of the Survey
of T^h 30th N R 12 W.
under Contract No.
364 Made with Lewis
H. W. Shelton.

E. annularis Commenced
Sept 14th 1892

Examination
Sept 15th Concluded
1892

Examined by
C. W. J. L.
Special Agent G. O.



Sappho Access – Bearing Tree Problems

Sec. 30, T30N, R12W, Willamette Meridian

Tp 30 N R 12 W.

Commence at
the corner to Secs. 25 &
36, 30 & 31 Tp 30 N
Range 12 & 13 W.
Which is a Hemlock
Post 4x4 firmly set.
Marked
T30N S 30 on N.E.
R12W S 31 on S.E.
R13W S 36 on S.W.
T30N S 25 on N.W.
faces with 6 notches on
E & W. and 1 on S
Edges. From which

A Hemlock 4 ft
diam bears S 68° E
408 lks dist Marked
T30N R12W S 31 B.T.

A Hemlock 3 ft
diam bears N 55° E
678 lks dist Marked
T30N R12W S 30 B.T.
No other Bearing trees
within distance
And run N. 89° 59' E
Va 25° 40' E

Open Prairie
5.50 Timber & Brush.
8.00 To a point 7 lks S
of an alder Post
Marked.
T30N S 30 on N
M.C. on E
R12W S 31 on S
From which

A Alder 6 in
diam bears N 5° E
28 lks dist Marked
T30 R12 S 30 M.C. B.T.

Tp 30 N R 12 W

level
Heavy underbrush.
37.00 To a point 2 lks S of
1/4 Cor bet Secs 30 & 31
Which is a Hemlock
Post. 3x3 firmly set
Marked. 1/4 S on N
face from which.

A Fir 4 ft
diam bears N 79° E
28 lks dist Marked.
1/4 S B.T.

A Hemlock 8 in
diam bears S 34° W
26 lks dist Marked
1/4 S B.T.

From the air found
I continue my line
39.00 Ascend about 25 ft.
40.50 Top of Hill
level

Heavy Fir timber
42.30 Trail course N & S
77.31 To a point 16 lks S
of the Cor to Secs 29-
30-31 & 32 which is
a Hemlock Post. 4x4
firmly set Marked
T30N S 29 on N.E.
R12W S 32 on S.E.
S 31 on S.W.
S 30 on N.W.
faces with 1 notch on
S and 5 notches on
E Edges from which

A Hemlock 8 in
diam bears N 32° E
38 lks dist Marked
T30 R12W S 29 B.T.

Sappho Access – Bearing Tree Problems

Sec. 30, T30N, R12W, Willamette Meridian

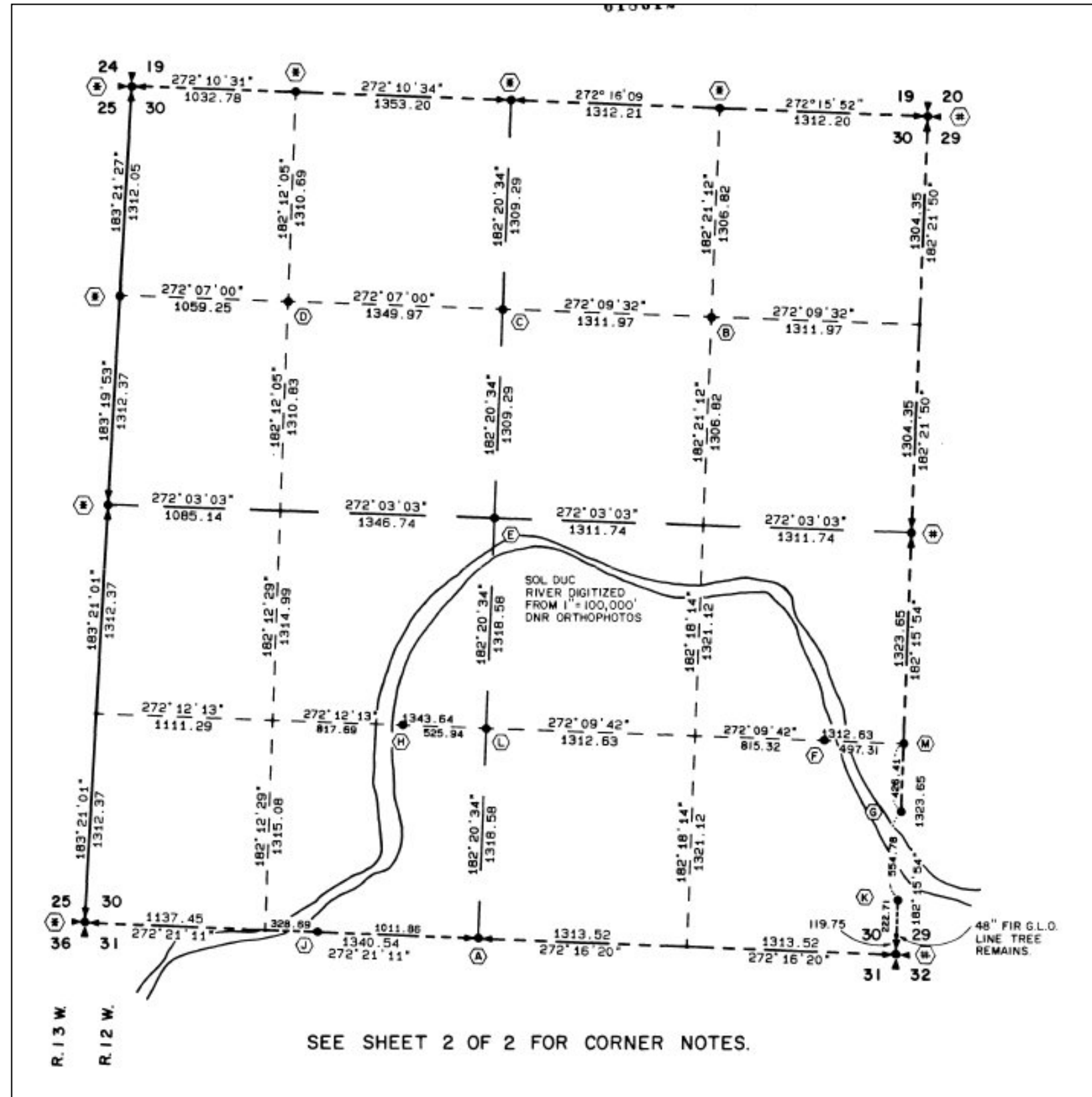
In 1988 DNR amended the survey of section 30.

(A) SOUTH 1/4 CORNER SEC. 30.

ACCEPTED CORNER.
EVIDENCE FOUND:

- REMAINS OF A 48" FIR BT WINDTHROW, DECAYED, BUT WITH VISIBLE SCRIBING, AS DESCRIBED IN THE FIELD NOTES, DATED SEPTEMBER 14 AND 15, 1892 OF THE EXAMINATION SURVEY OF CONTRACT NO. 364, BY C.W. IDE, SPECIAL AGENT OF THE COMMISSIONER OF THE GENERAL LAND OFFICE, WASHINGTON, D.C. (COPIES OF THE EXAMINATION FIELD NOTES ARE AVAILABLE IN THE DNR'S PERMANENT OFFICE FILE OF THIS PROJECT, OR THROUGH THE WASHINGTON D.C. OFFICE OF THE NATIONAL ARCHIVES). NO EVIDENCE OF THE SECOND BEARING TREE CALLED FOR IN THE EXAMINATION NOTES WAS FOUND.
- DNR CONCRETE MONUMENT SET BY DAN P. KOUSBAUGH, PLS 11983 ON 7/23/81 AND SHOWN ON DNR FINAL MAP NO. 555, (SEE LCR FILED UNDER AFN 522705, AND SURVEY VOL. 13, PAGE 26, RECORDS OF CLALLAM COUNTY) AT N.85° 37' 51" W., 169.48 FT., NOT ACCEPTED. REMAINS OF TWO ORIGINAL GLO BEARING TREES, WITH CHOPPED OUT FACES AND TRACES OF SCRIBE MARKS, IN CLOSE CONFORMANCE WITH THE FIELD NOTES OF GLO SURVEY, CONTRACT NO. 364 BY LEWIS D.W. SHELTON.
- REFERENCE POINTS TO THE KOUSBAUGH POSITION (SEE DNR FINAL MAP NO. 555, CITED ABOVE)
- RONALD NESARY, PLS 22344 OF NTI-CLARK ASSOCIATES IN PORT ANGELES, LOCATED THE REMAINS OF THE ABOVE SAID BEARING TREE, THE ORIGIN OF WHICH WAS NOT IMMEDIATELY CLEAR DUE TO A CONFLICT WITH THE FIELD NOTES OF THE GLO SURVEY OF THE TOWNSHIP PERFORMED BY LEWIS D.W. SHELTON UNDER CONTRACT NO. 364, DATED MAY 12, 1891.
- FURTHER RESEARCH BY THIS OFFICE LOCATED THE FIELD NOTES OF THE EXAMINATION SURVEY, WHICH NOTES DIFFERENT BEARING TREES AT THIS CORNER THAN DID THE FIELD NOTES OF CONTRACT NO. 364.
- A FIELD INSPECTION CONFIRMED THAT TWO SETS OF BEARING TREES HAD BEEN PREPARED BY SHELTON, BUT THAT ONE SET HAD BEEN DESTROYED BY HIM. THE SURVIVING SET OF BEARING TREES WERE NEVER NOTED IN THE FIELD NOTES OF CONTRACT NO. 364, BUT WERE RECOVERED AND NOTED BY IDE DURING THE COURSE OF HIS EXAMINATION SURVEY.
- SET A DNR CYLINDRICAL CONCRETE MONUMENT FOR THE SOUTH 1/4 CORNER OF SECTION 30 AT RECORD BEARING AND DISTANCE, AS REPORTED IN THE EXAMINATION NOTES, FROM THE REMAINS OF THE FOUND BEARING TREE.
- REFERENCES SET:
SET REFERENCE POINTS WITH DNR TAGS AND ALUMINUM NAILS:
- 13" ALDER AT N.27° W., 28.04 FT. RP NAIL RIGHT.
- 19" FIR AT N.61° E., 21.14 FT. RP NAIL LEFT.
- 12" HEMLOCK AT S.43° E., 8.09 FT. RP NAIL LEFT.
- SPIKE SET AT CENTER OF THE APPROXIMATE STANDING POSITION OF THE FIR BT FOUND BY NESARY AND NOTED BY C.W. IDE AT N.79° E., 18.48 FT.
- PERPETUATED THE KOUSBAUGH POSITION: SET A CONCRETE FILLED LENGTH OF 2-1/4" PVC PIPE AT N.88° W., 169.48 FT. DESTROYED REFERENCE POSTERS, BUT LEFT RP NAILS INTACT AS NOTED ON DNR FINAL MAP NO. 555, CITED ABOVE.

FB 569.19 L. P. 21

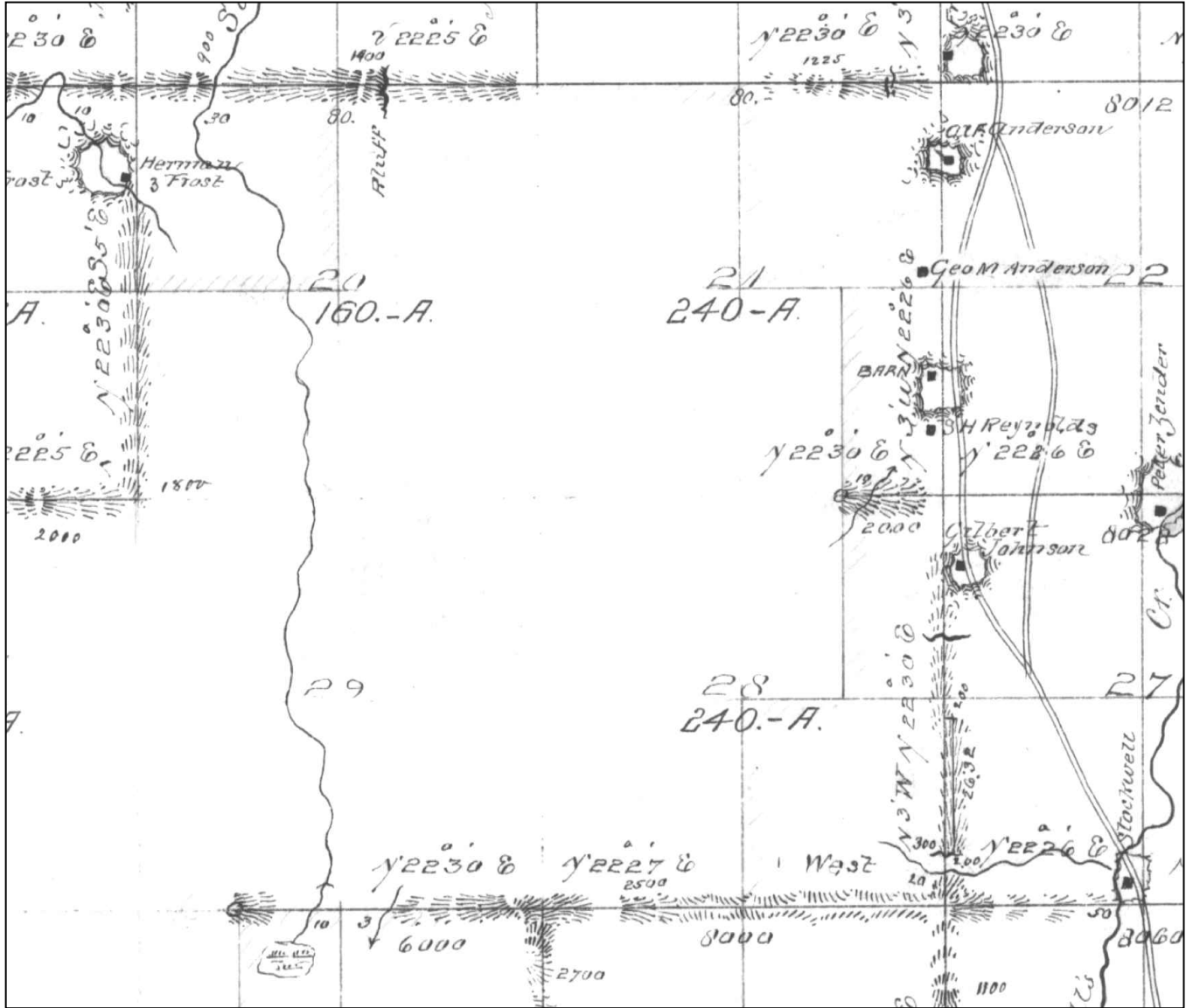


Teeoff Survey – A Platting Blunder

Sections 21 and 28, T40N, R5E, Willamette Meridian

Total Number of Acres: 19853.98								
SURVEYS DESIGNATED	BY WHOM SURVEYED	CONTRACT		AMOUNT OF SURVEYS			WHEN SURVEYED	MEAN DECLINATION
		Nº	DATE.	MS	CHS	LKS		
Survey Tenth St & Par	Louis P. Ouellette.	346	June 23 rd 1890	6	00	00	Commenced:	22°24'E.
Survey East Bd	" " "	"	" " "	5	76	45	August 18 th '91	
Resurvey fr W. Bd	" " "	"	" " "	4	00	95	Completed:	
Section lines	" " "	"	" " "	52	67	11	Oct. 14 th 1891	
Connection lines	" " "	"	" " "	1	18	98		
Meander lines	" " "	"	" " "	—	57	56		

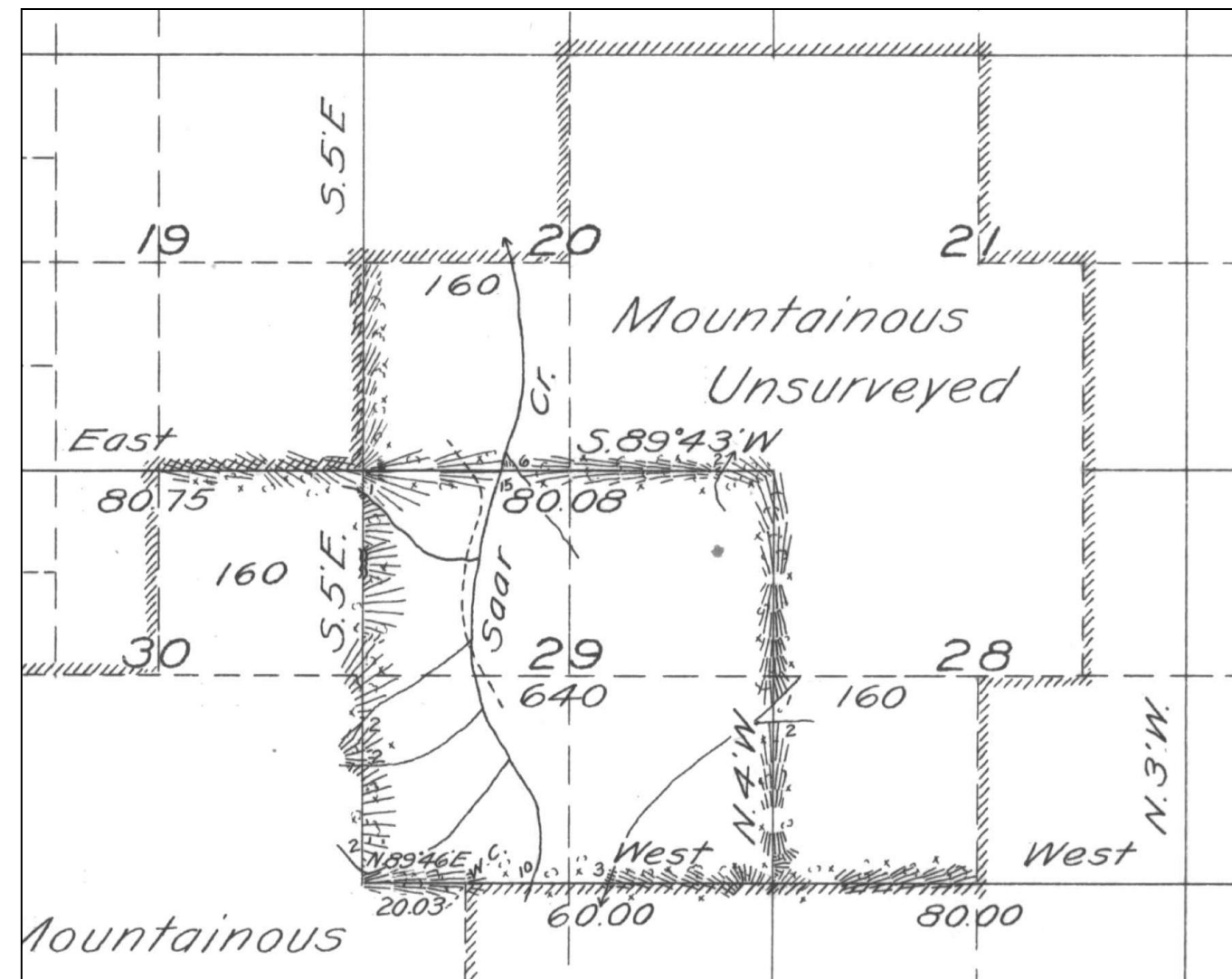
In 1891 GLO surveyor Louis P. Ouellette surveyed portions of sections 21 and 28. The lines surveyed and the areas returned on the plat suggest that subdivision lines should be surveyed as follows. The north half of the north-south centerline of section 21 should be surveyed parallel to the north half of the east section line. The east half of the east-west centerline of section 21 should be surveyed on a weighted mean bearing of the east half of the north section line and the east quarter of the south section line. The south half of the north-south centerline of section 28 should be surveyed parallel to the south half of the east section line and the east half of the east-west section line should be surveyed on a weighted mean bearing of the east half of the south section line and the east quarter of the north section line. The west boundary of the E1/2 of the SE1/4 of section 21 and the west boundary of the E1/2 of the NE1/4 of section 28 should be surveyed by connecting opposite 1/16 corners. The E1/16 corner on the line between sections 21 and 28 was monumented by the GLO survey, although it was called out in the field notes as a witness corner to the quarter section corner. The CE1/16 corner of each section is at a midpoint between the east quarter corners and the center quarter corners established in the manner described above.



Sections 21 and 28, T40N, R5E, Willamette Meridian

Surveys Designated	By Whom Surveyed	Contract		Amount of Surveys			When Surveyed	
		No.	Date	Ms.	Chs.	Lks.	Begun	Completed
Subdivisions	Albro Gardner	Sp. Ins.	Oct. 25, 1902	3	20	11	Jan. 7, 1903	Jan. 11, 1903

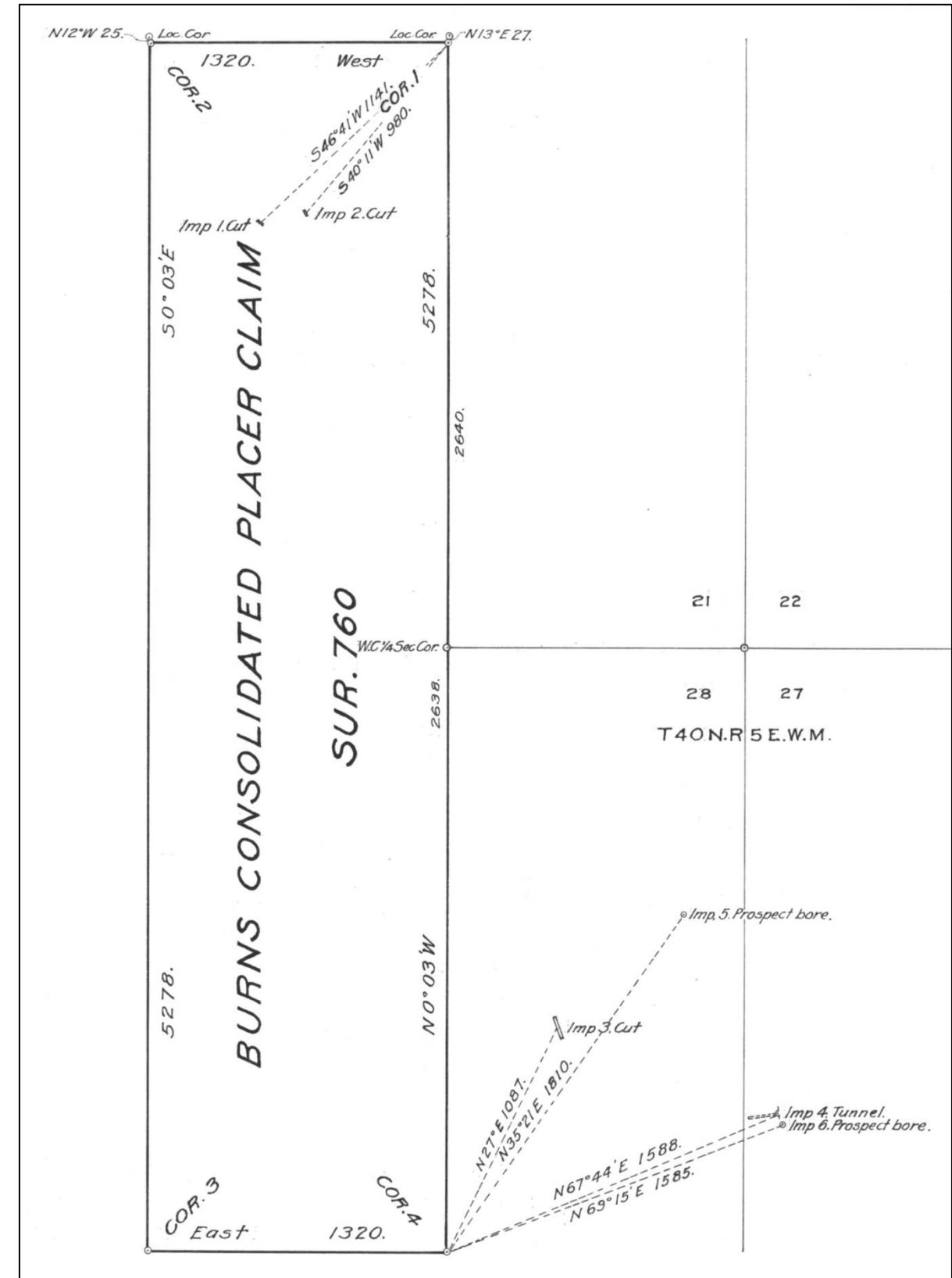
In 1902 GLO surveyor Albro Gardner surveyed the west line of section 28 creating the southwest quarter of section 28. The plat indicates that the north line of the southwest quarter section is surveyed by connecting the center quarter corner previously determined for the southeast quarter section with the newly surveyed west quarter corner. The platted 160 acres in the southwest quarter section is protected because all distances are reported as being regular.



Sections 21 and 28, T40N, R5E, Willamette Meridian

In 1904 the Burns Consolidated Placer Claim was surveyed in sections 21 and 28. The only previously established corner that was tied by the mineral survey, a metes and bounds survey, was the witness corner to the quarter corner between sections 21 and 28. That corner is also the E1/16 corner between the two sections and is a corner of the placer claim survey. Although the placer claim is strictly a metes and bounds survey it is surveyed as if it might be the W1/2 of the SE1/4 of section 21 and the W1/2 of the NE1/4 of section 28. No section subdivision procedures were followed to ensure that the mineral survey corners were located at aliquot part corners of the sections.

Claim Located January 30, 1904
Mineral Survey No. 760
Lot No.
Seattle Land District.
PLAT
OF THE CLAIM OF
W. J. Burns
KNOWN AS THE
Burns Consolidated Placer Claim
IN Mount Baker MINING DISTRICT,
WHATCOM COUNTY, WASHINGTON
Containing an Area of 159.939 Acres.
Scale of 500 Feet to the inch.
Variation 23° E.
SURVEYED October 24-28 1904 BY
R. B. Symington U.S. Deputy Mineral Surveyor,
The Original Field Notes of the Survey of the Mining Claim of
W. J. Burns
known as the Burns Consolidated Placer Claim.

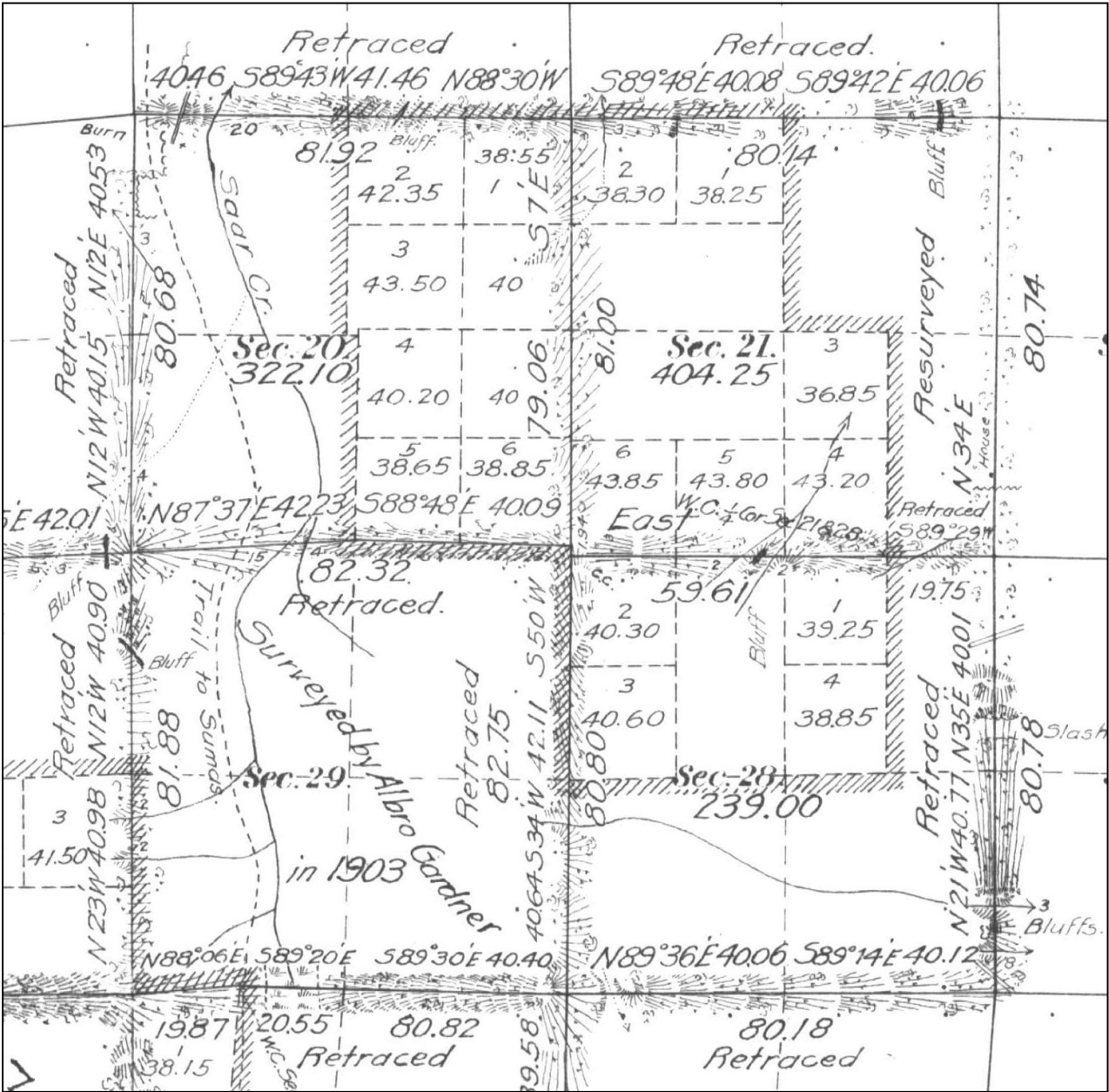


Teeoff Survey – A Platting Blunder

Sections 21 and 28, T40N, R5E, Willamette Meridian

Surveys Designated	By Whom Surveyed	Date of Contract		Amount of Surveys			When Surveyed Begun	Completed.
		No		M.	Ch. ^s	Lk. ^s		
Subdivisions	C. Frank Rhodes	643	March 5, 1907	3	65	66	June 10, 1908	July 26, 1908
Resur: Sub.	"	"	"	1	00	74	June 14, 1908	June 14, 1908
Retrace "	"	"	"	11	35	04	June 13, 1908	July 24, 1908
Resurvey W. Bdy	"	"	"	2	5	30	July 17, 1908	July 18, 1908
Retrace S "	"	"	"	2	2	43	July 20, 1908	July 21, 1908
West Boundary	John A. Tennant	179	Sep ^t 17, 1873				Nov 27, 1873	Nov 28, 1873
Resur: W. bdy	Louis P. Ouellette	346	June 23, 1890				Sep 29, 1890	Sep 29, 1890
South Boundary	Isaac M. Golbraith	337	June 15, 1889				Nov 17, 1889	Nov 17, 1889
Connections	C. Frank Rhodes	643	March 5, 1907		12	59	June 10, 1908	July 26, 1908

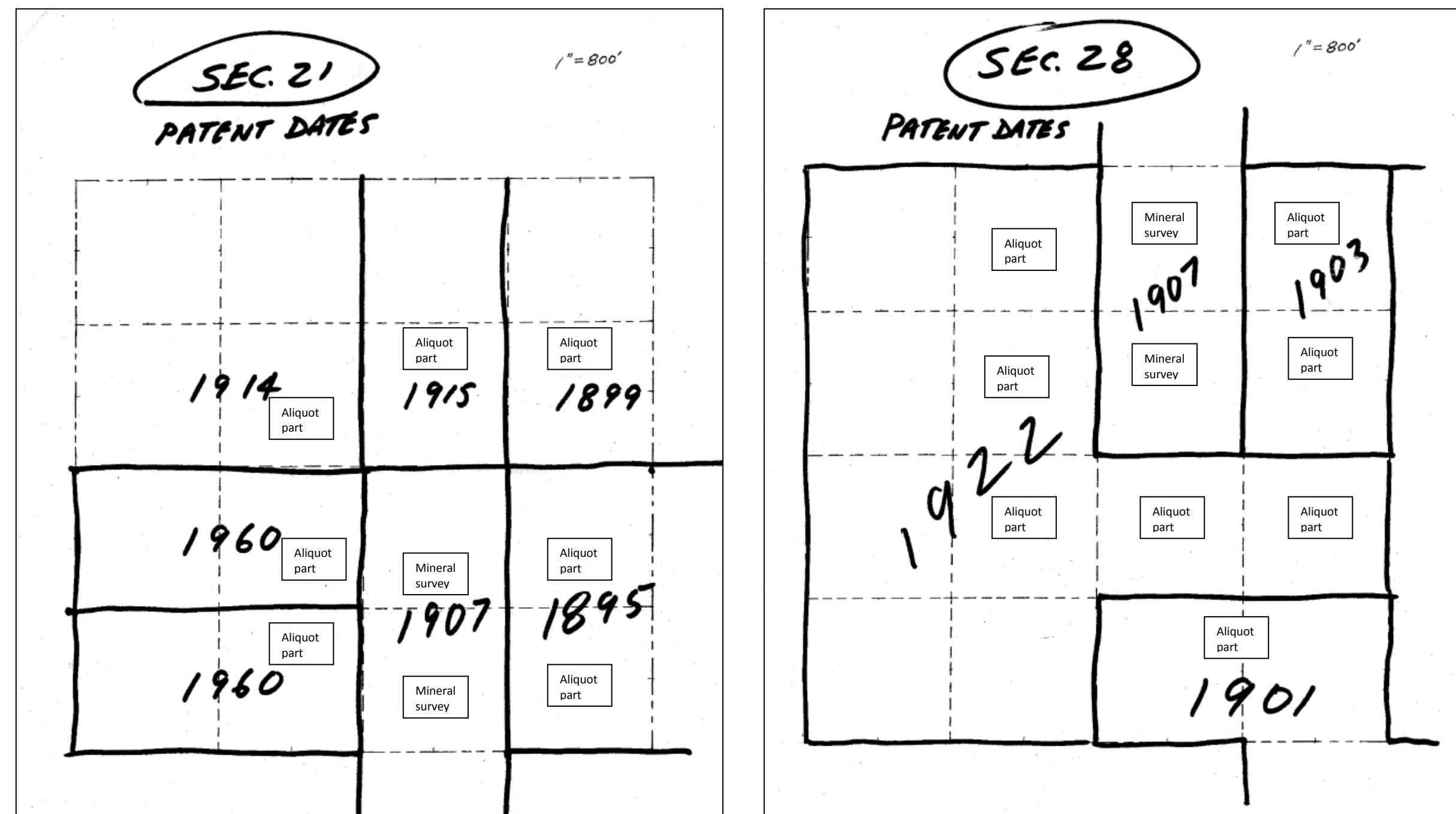
In 1908 GLO surveyor C. Frank Rhodes completed the surveys of sections 21 and 28 creating lots in the vicinity of where the mineral survey was located. The lots (3 and 4 in section 21 and 1 and 4 in section 28) would be surveyed differently from the mineral survey. Depending on what was patented and when the patents were granted there could be various sorts of overlaps and gaps in the two sections. An additional section subdivision difficulty is that there seems to be no combinations of assumed parenthetical distances that would produce the lot acreages shown on the plat. Both sections 21 and 28 have only one center quarter corner which is surveyed in the manner prescribed by the original 1890 plat.



Teeoff Survey – A Platting Blunder

Sections 21 and 28, T40N, R5E, Willamette Meridian

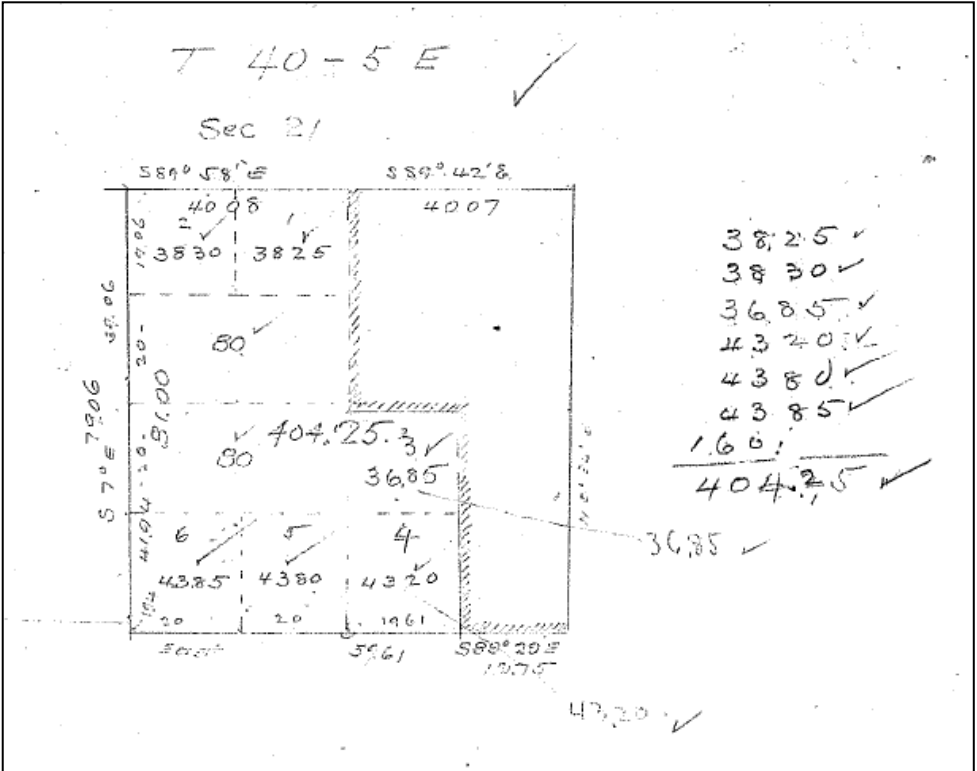
The mineral survey was patented in 1907. The four lots shown on the Rhodes GLO plat in the approximate location of the mineral survey were never patented. Where the aliquot parts of sections 21 and 28 were patented before the mineral survey the aliquot parts have senior rights to any overlap between the surveys. Where the aliquot parts were patented after the mineral survey the mineral survey has senior rights to any overlap. Where there is a gap between the mineral survey and patented aliquot parts the land continues to be in federal ownership.



Teeoff Survey – A Platting Blunder

Sections 21 and 28, T40N, R5E, Willamette Meridian

On this and the following page are parts of the calculation sheets for creating the Rhodes plat. On the next page are the calculations balancing the measured distances around the sections. There are no calculations of parenthetical distance inside the sections, as would be the case if the lot acreages were calculated. Because of the the lack of parenthetical calculations and because there are no parenthetical distance assumptions that produce the official lot acreages the conclusion is that the acreages were scaled in some manner. Parenthetical distances can be deduced from which 1/16 section areas were returned as fractional lots and which were returned as aliquot parts.



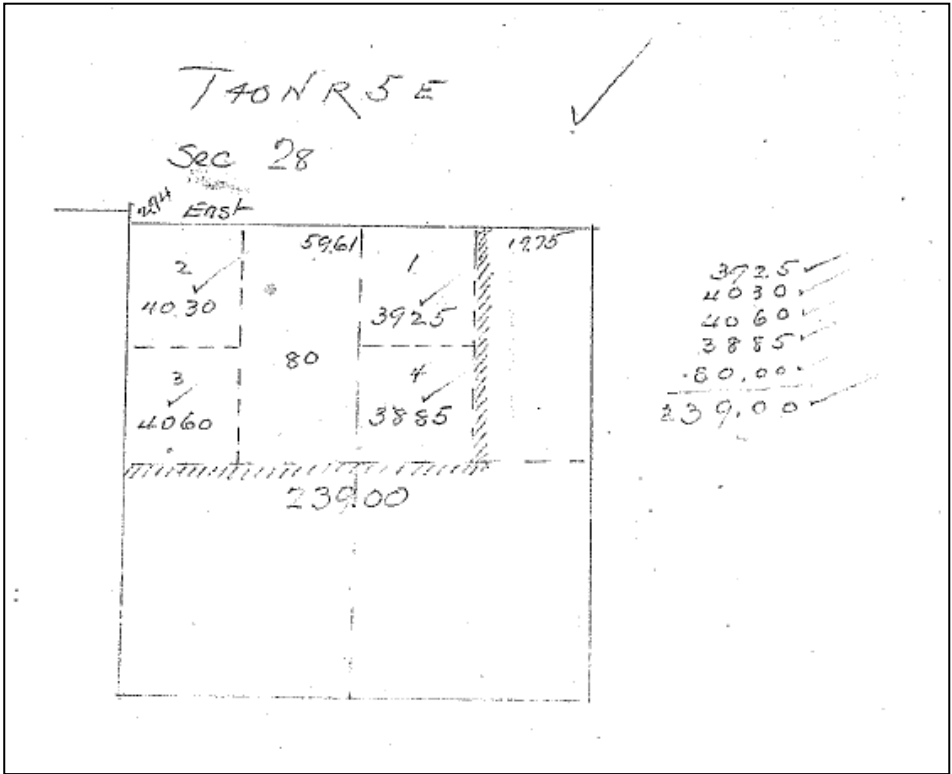
Reproduced at the National Archives and Records Administration – Pacific Alaska Region (Seattle)

Calculations

Frank C. Rhodes Cont. No. 643
by whom

T. 23 N., R. 0 E.	✓	G. F. N.	transcribed
T. 23 N., R. 9 E.	✓	E. B. G.	gone to transcription
T. 28 N., R. 16 E.	✓	L. P. O.	gone to transcription
T. 36 N., R. 20 E.	✓	L. P. O.	gone to transcription
T. 40 N., R. 5 E.	✓	L. P. O.	transcribed

Indian allotments



Teeoff Survey – A Platting Blunder

Sections 21 and 28, T40N, R5E, Willamette Meridian

Notes T. 40 N. R. 5 E.

Traverse of _____ bank of _____ Sec. T. 40 N. R. 5 E. W. M.

NO.	COURSE.	DISTANCE.	LATITUDE.		DEPARTURE.		TOTALS.	
			NORTH.	SOUTH.	EAST.	WEST.	LAT.	DEP.
1	N 71° 0' 50" E	194	194		02		+ 194	+ 3
2	N 71° 0' 07" W	79 06	79 06			16	+ 79 06	- 16
3	S 89° 54' E	40 08		02	40 08		+ 81 00	- 13
4	S 89° 42' E	40 09		21	40 07		+ 81 02	+ 39 97
5	S 80° 30' W	80 75		80 75		75	- 80 67	+ 80 06
6	S 89° 29' W	19 75		18		19 75	- 18	- 19 74
7	West	59 61				59 61	00	00
			81 00	81 16	80 18	80 27		

Notes

Traverse of _____ bank of _____ Sec. T. 40 N. R. 5 E. W. M.

NO.	COURSE.	DISTANCE.	LATITUDE.		DEPARTURE.		TOTALS.	
			NORTH.	SOUTH.	EAST.	WEST.	LAT.	DEP.
1	N 71° 0' 34" E	40 64	40 64		40		+ 40 56	+ 1 40
2	N 71° 0' 50" E	40 16	40 16		58		+ 40 08	+ 58
3	East	59 61			59 61		+ 80 64	+ 59 61
4	S 89° 29' E	19 75		18	19 75		+ 80 64	+ 60 59
5	S 80° 35' W	40 01		40 01		41	+ 80 82	+ 80 34
6	S 80° 21' E	40 77		40 77	25		- 40 08	- 41
7	N 89° 14' W	40 12	54			40 12	+ 40 74	+ 79 93
8	S 89° 36' W	40 06		28		40 06	- 40 84	+ 25
			81 52	81 06	80 59	80 59	00	00

Teeoff Survey – A Platting Blunder

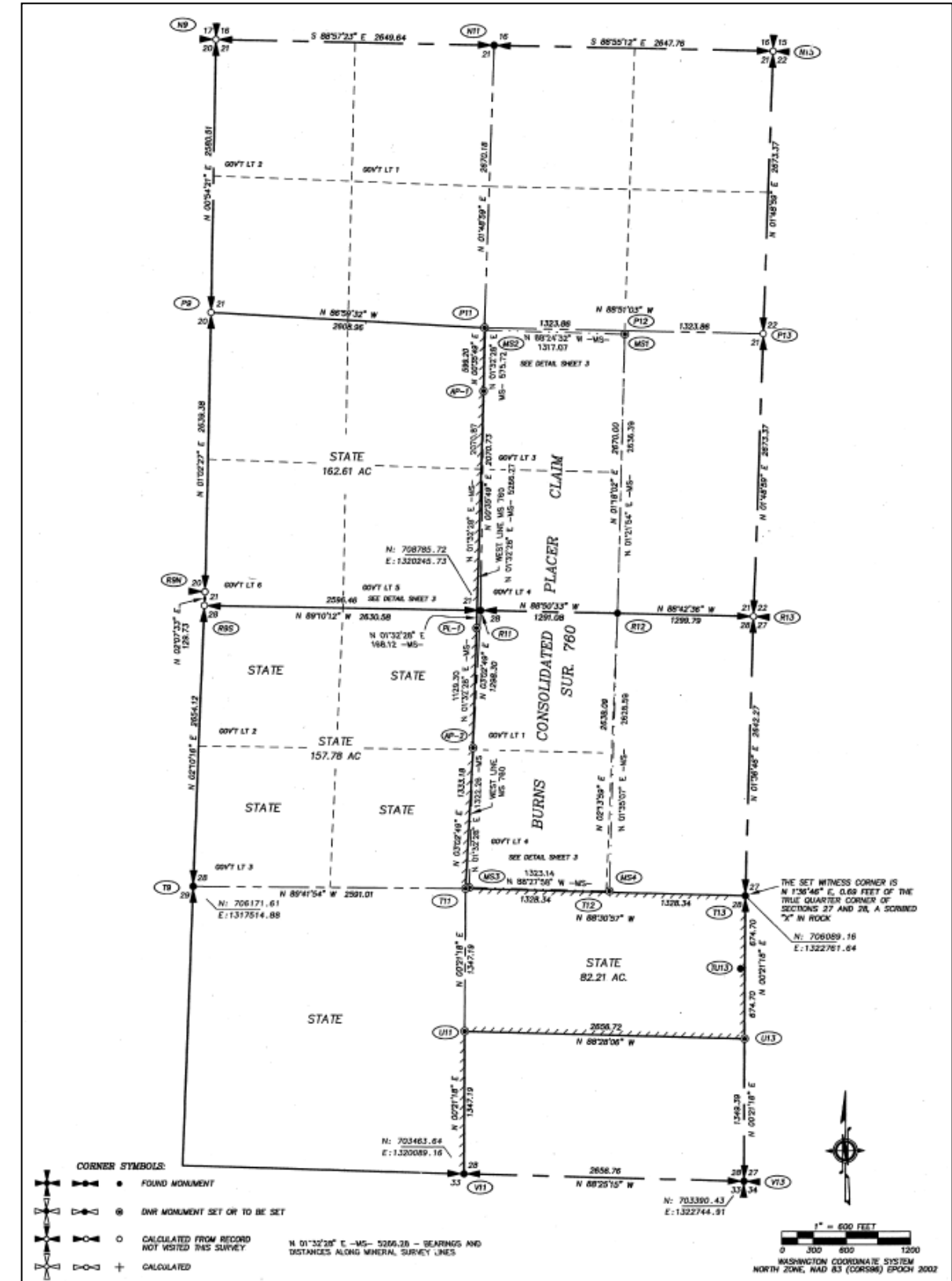
Sections 21 and 28, T40N, R5E, Willamette Meridian

In 2009 DNR surveyed state land in the two sections. The odd center quarter section corners and the mineral survey gaps and overlaps create unusual ownership lines. See the survey narrative below and the enlargements on the following two pages.

DURING OUR FIELD SEARCHES IN 2008, ORIGINAL GLO CORNER MARKERS WERE FOUND FOR TWO CORNERS THAT WERE ERRONEOUSLY MARKED WITH DNR CONCRETE MONUMENTS IN THE LATE 1960'S. THE ORIGINAL STONE AT THE CORNER OF SECTIONS 27, 28, 33 & 34 IS NORTHERLY, 1.4 FEET FROM THE 1969 CONCRETE MONUMENT. THE ORIGINAL GLO "X" AND "1/4" IN SURFACE BEDROCK AT THE 1/4 SECTION CORNER OF SECTIONS 27 & 28 IS NORTHWESTERLY, 0.8 FEET FROM THE DNR CONCRETE MONUMENT. THE BOUNDARY LINES ON THIS SURVEY CONNECT THE ORIGINAL CORNER MARKERS TO THE NEAREST ACCEPTED MONUMENTS. THE MINOR SUBDIVISION CORNERS IN SECTIONS 27, 28, 33 AND 34, WHICH WERE CALCULATED AND SET BASED ON THE OLD DNR CONCRETE MONUMENTS, ARE ACCEPTED AS VALID CORNER MONUMENTS.

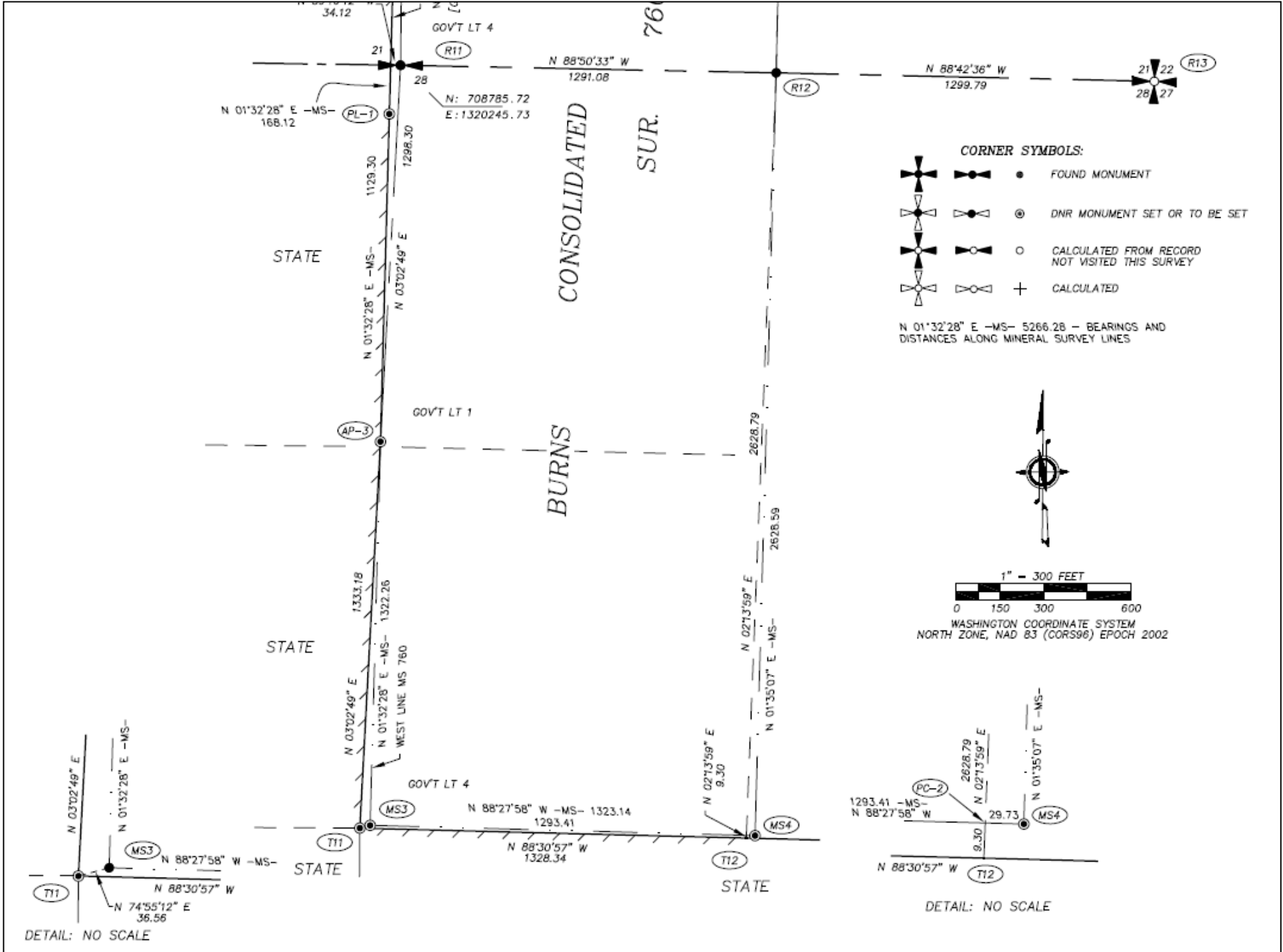
THE GLO SURVEYS, AS DEPICTED ON THE PLATS DATED 1892, 1903 AND 1909 AND THE PLAT FOR MINERAL SURVEY NO. 760, MAKE THE SUBDIVISION OF SECTIONS 21 AND 28 IRREGULAR. THE 1892 PLAT SHOWS THE NORTH AND EAST LINES OF SECTION 21 AND THE EASTERLY ONE-QUARTER MILE OF THE LINE BETWEEN SECTIONS 21 AND 28. THE SAME PLAT ALSO SHOWS THE EAST AND SOUTH LINES OF SECTION 28. THE 1903 PLAT SHOWS THE ESTABLISHMENT OF THE WEST LINE OF SECTION 28. THE 1904 GLO PLAT OF MINERAL SURVEY NO. 760 SHOWS A METES AND BOUNDS SURVEY WITHIN SECTIONS 21 AND 28, ANCHORED AT THE WITNESS CORNER TO THE 1/4 CORNER OF SECTIONS 21 AND 28. THE 1909 PLAT SHOWS THE COMPLETION OF SECTIONS 21 AND 28, CREATED SEVERAL GOVERNMENT LOTS AND MADE NO MENTION OF THE MINERAL SURVEY. COPIES OF THE 1909 GLO DRAFTSMAN'S CALCULATION SHEETS WERE OBTAINED FROM THE FEDERAL ARCHIVES. IT IS APPARENT FROM THE CALCULATION SHEETS THAT THE GLO DRAFTSMAN OBTAINED THE ACRESAGES USING GRAPHICAL METHODS AFTER BALANCING THE LATITUDES AND DEPARTURES OF THE PLAT COURSES. IT ALSO APPEARS THAT ONLY ONE CENTER 1/4 SECTION CORNER IS INTENDED FOR EACH SECTION, TO BE CALCULATED USING A BEARING-BEARING INTERSECTION TO PROTECT THE AREAS SURVEYED BY THE 1892 PLAT (DESCRIBED FURTHER IN THE FOLLOWING CORNER NOTES). THE SIXTEENTH SECTION CORNERS NEEDED FOR THIS SURVEY ARE CALCULATED AT MIDPOINTS.

SENIOR/JUNIOR RIGHTS – AS MENTIONED ABOVE, MINERAL SURVEY NO. 760 (BURNS CONSOLIDATED PLACER CLAIM) WAS SURVEYED ON THE GROUND AS A METES AND BOUNDS SURVEY (PLAT APPROVED IN 1904), PRIOR TO THE COMPLETION OF THE GLO SURVEYS OF SECTIONS 21 AND 28. A FEDERAL PATENT (1907) WAS ISSUED FOR THE PLACER CLAIM THAT PREDATES COMPLETION OF THE GLO SURVEY OF SECTIONS 21 AND 28 AND THE PATENTS INVOLVING STATE LAND. THIS SURVEY RECOGNIZES THE SENIOR RIGHTS OF THE PLACER CLAIM AND SHOWS THE BOUNDARIES OF STATE LANDS AS FOLLOWS: THE STATE LAND IS BOUNDED BY THE SECTION SUBDIVISION LINES WHERE A GAP EXISTS BETWEEN SAID SUBDIVISION LINES AND THE PLACER CLAIM. WHERE THERE IS AN OVERLAP, THE PLACER CLAIM BOUNDARY CONTROLS.



Sections 21 and 28, T40N, R5E, Willamette Meridian

The mineral survey overlaps with the N1/2 of the NW1/4 of section 28 and, because the mineral patent was prior to the patent of state lands, the state lands lose part of that quarter section to the mineral survey owner. In the S1/2 of the NW1/4 and along the north line of the SE1/4 there is a gap between the mineral survey owner and the state ownership. The gap remains in federal ownership.



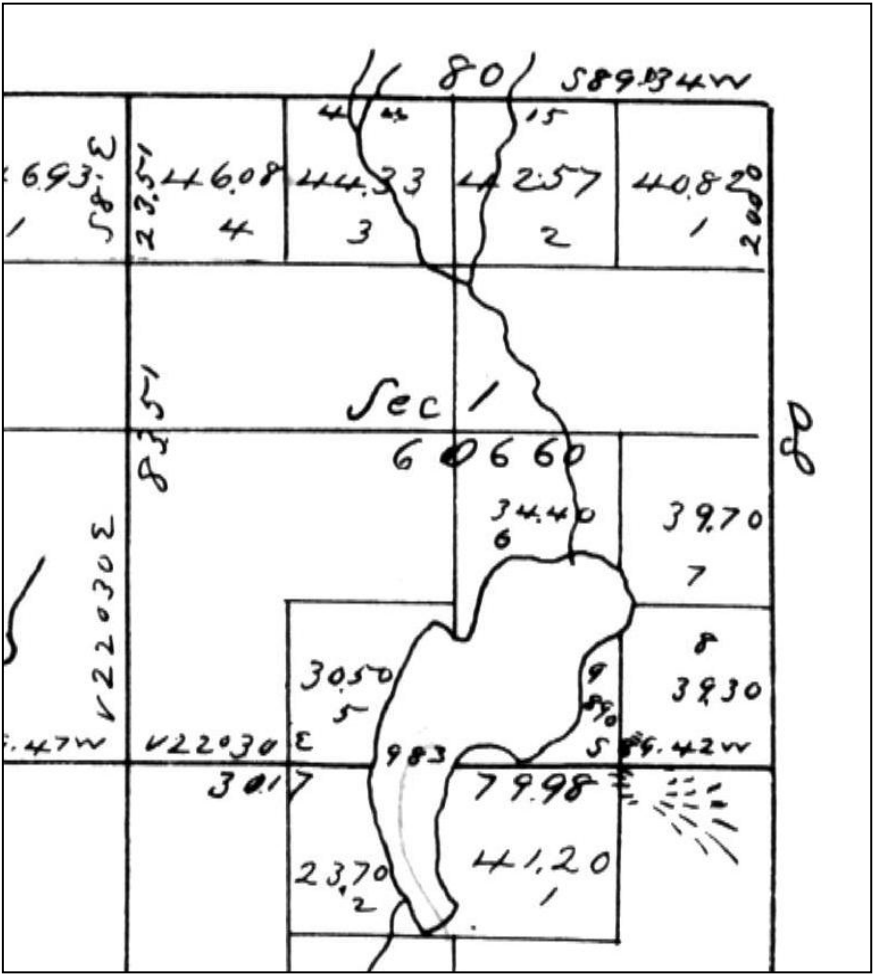
Sections 21 and 28, T40N, R5E, Willamette Meridian

[illegible]

Mission Bearable – Center Quarter Corner Bamboozlement
Section 1, T23N, R2W, Willamette Meridian

Surveys designated	By whom Surveyed	Contract		amt of Survey			When Surveyed	When commenced
		No	Date	miles	Chrs	Links		
North boundary	Ross P. Shoecraft	189	9 th March 1874	5	79	86	20 April 1874	6 April 1874
Subdivisions	" "	"	" " "	60	11	59	11 May "	
Meanders	" "	"	" " "	11	09	49	" " "	
Total No. of acres	22711.04							

In 1874 GLO surveyor, Ross P. Shoecraft, subdivided T23N, R2W, in Mason County. The quarter corner of sections 1 and 12 served also as a meander corner on the east side of an unnamed lake.



South $89^{\circ}42'W$ on line line bet. Sec 1 & 12
Var. $22^{\circ}30'E$.

39.98 East shore of lake. Set a fir post 4 in dia \times $4\frac{1}{2}$ ft.

long. 1 ft. in ground for $\frac{1}{4}$ Sec. & Meander Cor. to
fact Secs. 1 & 12 from which
at fir 5 in. dia. $80^{\circ}3'E$ 22 lks. dist.
at meander 3 " " " $S. 68^{\circ}W$ 43 " "

49.81 West shore of lake. Set a fir post 4 in dia 5 ft.
long & 1 ft. in ground for Meander Cor to Secs
1 and 12 from which
at fir 15 in. dia. $80^{\circ}3'E$ 22 lks. dist.
" " 12 " " " $S. 53^{\circ}W$ 43 " "

79.98 The cor to Secs 1, 2, 11 and 12

Mission Bearable – Center Quarter Corner Bamboozlement

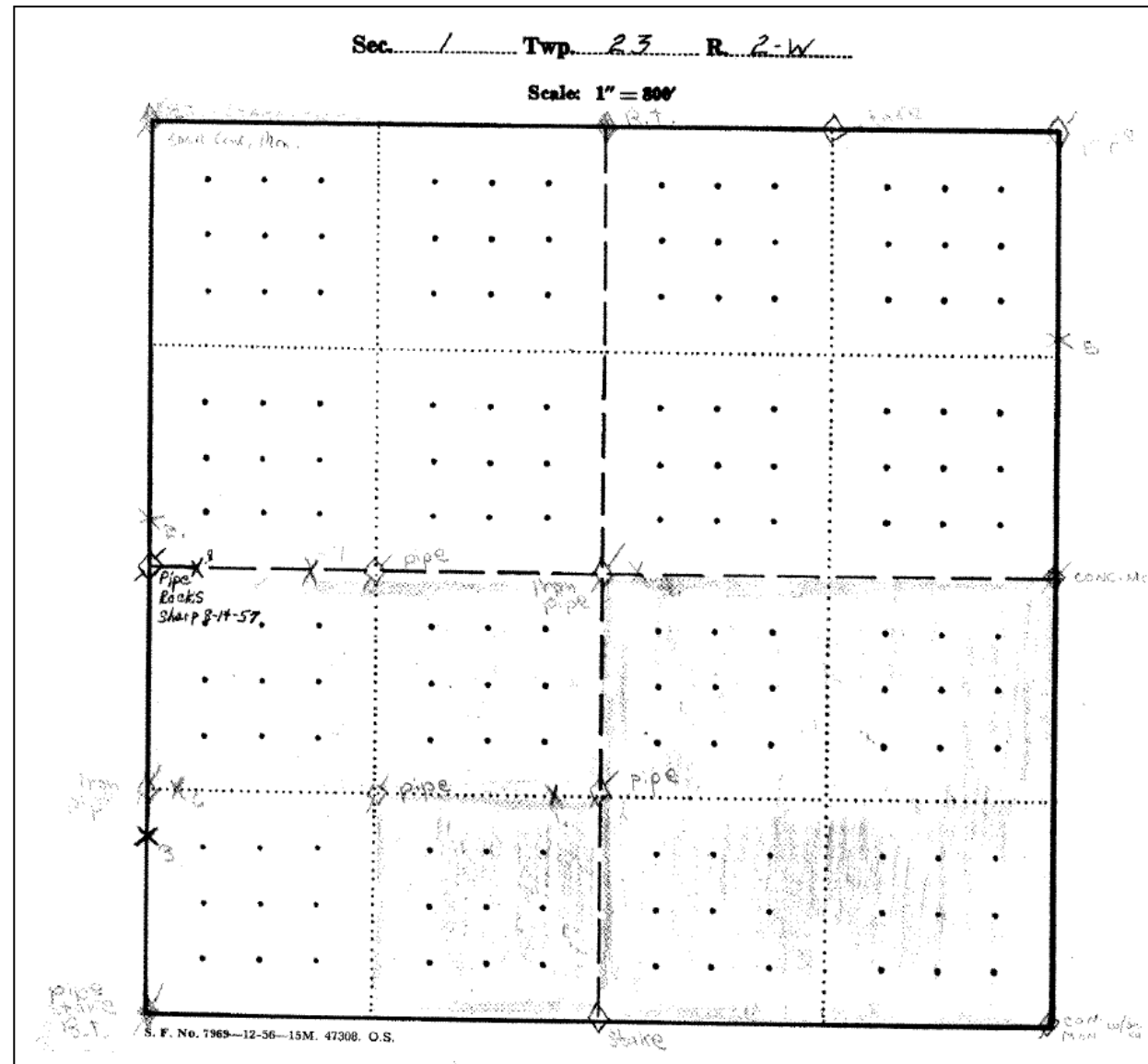
Section 1, T23N, R2W, Willamette Meridian

In 1957 DNR foresters set a pipe for the center quarter corner and several 1/16 corners. The foresters were not state licensed land surveyors and employed improper methods. See the survey narrative.

SURVEY NARRATIVE:

SECTION 1:

THE STATE FIRST ACQUIRED TITLE TO THE NORTH HALF OF THE SOUTHWEST QUARTER IN 1941. A CORNER RECORD SHEET FOUND AT THE STATE OF WASHINGTON DEPARTMENT OF NATURAL RESOURCES (DNR) SOUTH PUGET REGION OFFICE IN ENUMCLAW INDICATES THAT DNR EMPLOYEES SET AN IRON PIPE AT THE CENTER 1/4, "...BASED ON A SUBDIVISION OF THE SOUTHWEST QUARTER OF THE SECTION ACCORDING TO GLO DISTANCES, BY PAUL SHARP AND JOHN KINGSBURY, USING STAFF COMPASS AND CHAIN, DURING JULY, 1957." NO DIMENSIONS WERE GIVEN. SHARP AND KINGSBURY WERE NOT LAND SURVEYORS AND NOT AUTHORIZED BY STATUTE TO SET PROPERTY CORNERS. THEY DID NOT FOLLOW PROPER SECTION SUBDIVISION PROCEDURE. BASED ON CONTEMPORARY MEASUREMENTS IT APPEARS THAT THEY ATTEMPTED TO PLACE THE PIPE 2640 FEET FROM THE WEST AND SOUTH QUARTER CORNERS, IGNORING THE NORTH AND EAST QUARTER CORNERS. THE STATE ACQUIRED THE SOUTH HALF OF THE NORTHWEST QUARTER IN 1969 AND IN 1970, GOVERNMENT LOT 1, THE NORTH HALF OF THE SOUTHWEST QUARTER OF THE NORTHWEST QUARTER, AND THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER OF THE NORTHWEST QUARTER.



8/16/62 Paul Sharp replaced old post and tag with new white "X" post and tag - 1090' S to SW section corner, Aug. 11, 1961 Paul Sharp removed white X post and marker on side (S) of Bear Creek Road approx. 780' N of W 1/4 corner.

7-18-57 Paul Sharp inspected post and marker 1090' N. of SW corner and reported them in good shape.

7-18-57 Sharp inspected post and marker 1 tally N of W 1/4 cor. and reported them in good shape.

8-11-57 Sharp placed an iron pipe in the SW 1/4 cor. 2/1 and then measured the distance E to the edge of the road and set a post and tag 185 feet E of the 1/4 cor.

8-14-57 Paul Sharp set an iron pipe and a rock pile at the W 1/4 corner and ran the line E. from the corner to the river.

8-21-57 Paul Sharp set an iron pipe at the SW 1/4 corner and placed a post and marker at roadside 165' E of the corner.

8-26-57 Paul Sharp set a post and marker at roadside 980' E of the W 1/4 corner.

6-24-57 Paul Sharp set a post and marker at roadside 92' W of S & 1/4 corner.

6-26-63 Paul Sharp set a post and marker (replaced - old post not found) 900' E of W 1/4 cor.

All above work by Paul Sharp is based on a subdivision of the SW 1/4 of the section according to 640 distances, by Paul Sharp and John Kingsbury, using staff compass and chain, during July, 1957.

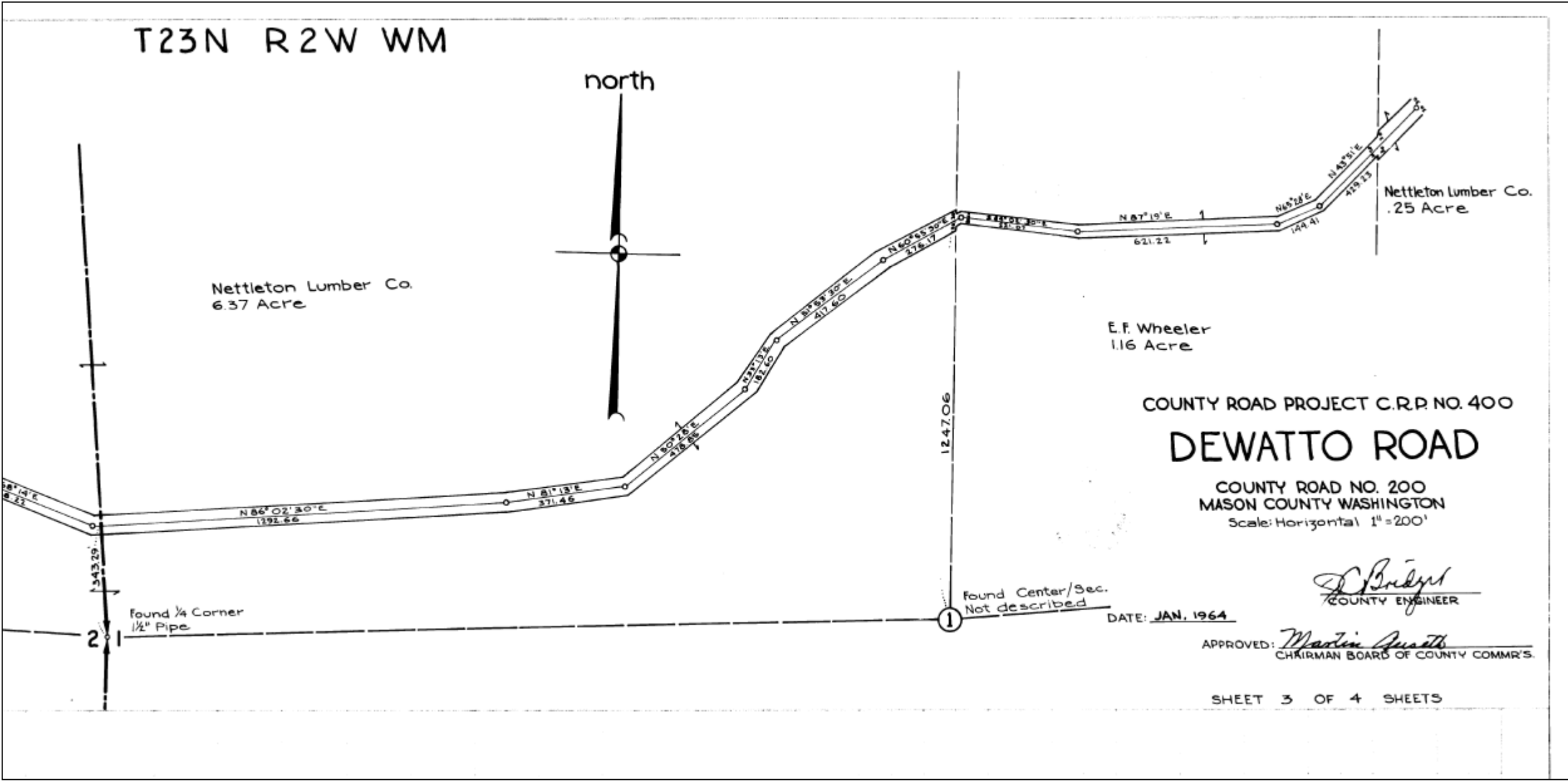
8-18-62 C.A. Kelly replaced old post (and marker?) 123' E of SW 1/4 corner.

Mission Bearable – Center Quarter Corner Bamboozlement
Section 1, T23N, R2W, Willamette Meridian

From the survey narrative:

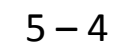
A 1964 MASON COUNTY ROAD PROJECT MAP SHOWS THE CENTER QUARTER OF SECTION 1 AS "FOUND CENTER/SEC. NOT DESCRIBED."

Apparently Mason County tied the county road plan to the pipe set by DNR foresters.



Section 1, T23N, R2W, Willamette Meridian

A 1976 RIGHT OF WAY PLAT BY WILLIAM G. MURDOCK OF DNR SHOWS A PROPERLY CALCULATED CENTER OF SECTION AS AN INTERSECTION OF THE LINES BETWEEN THE NORTH AND SOUTH AND THE EAST AND WEST QUARTER CORNERS. THIS PLAT DID NOT ACCOUNT FOR THE PRESENCE OF GOVERNMENT LOTS ALONG THE NORTHERN TIER AND THEREFORE DID NOT SUBDIVIDE THE NORTH HALF OF THE SECTION BY AN ACCEPTABLE METHOD.



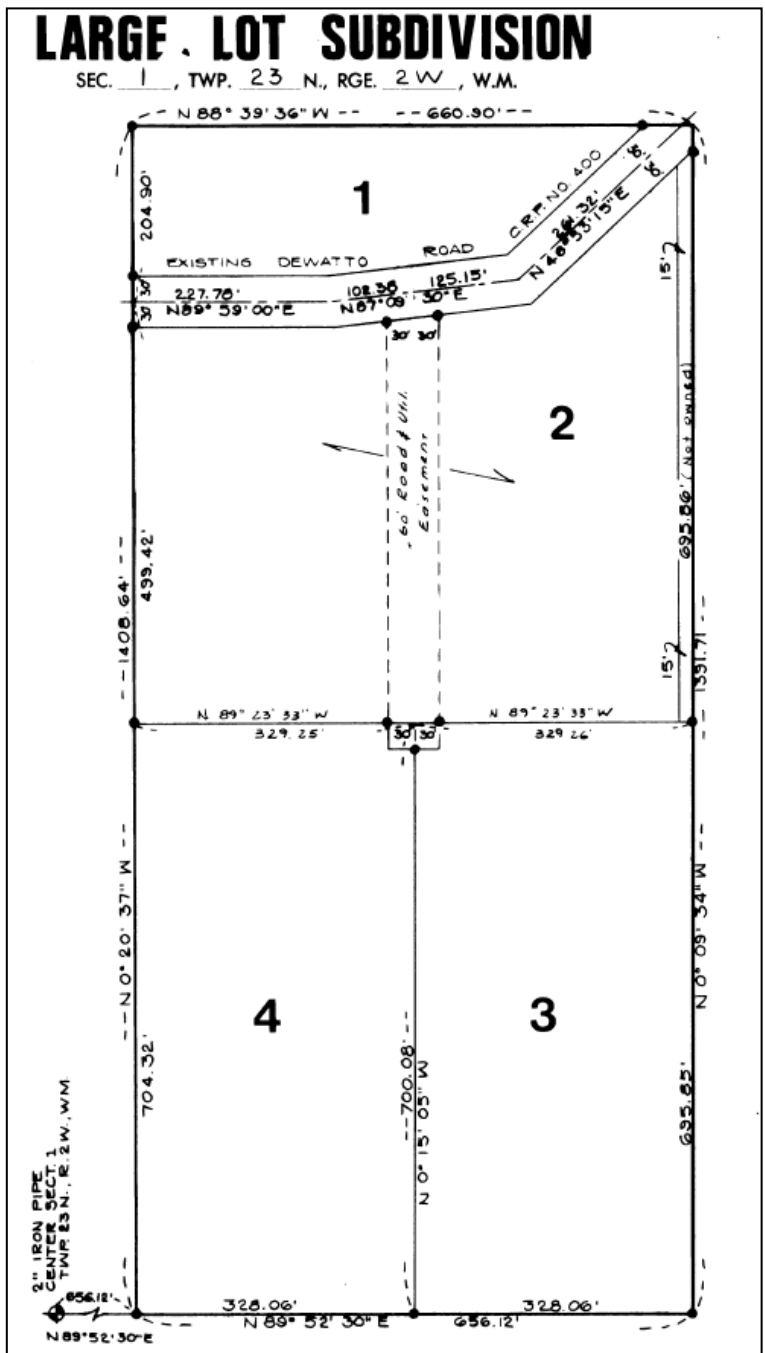
Mission Bearable – Center Quarter Corner Bamboozlement

Section 1, T23N, R2W, Willamette Meridian

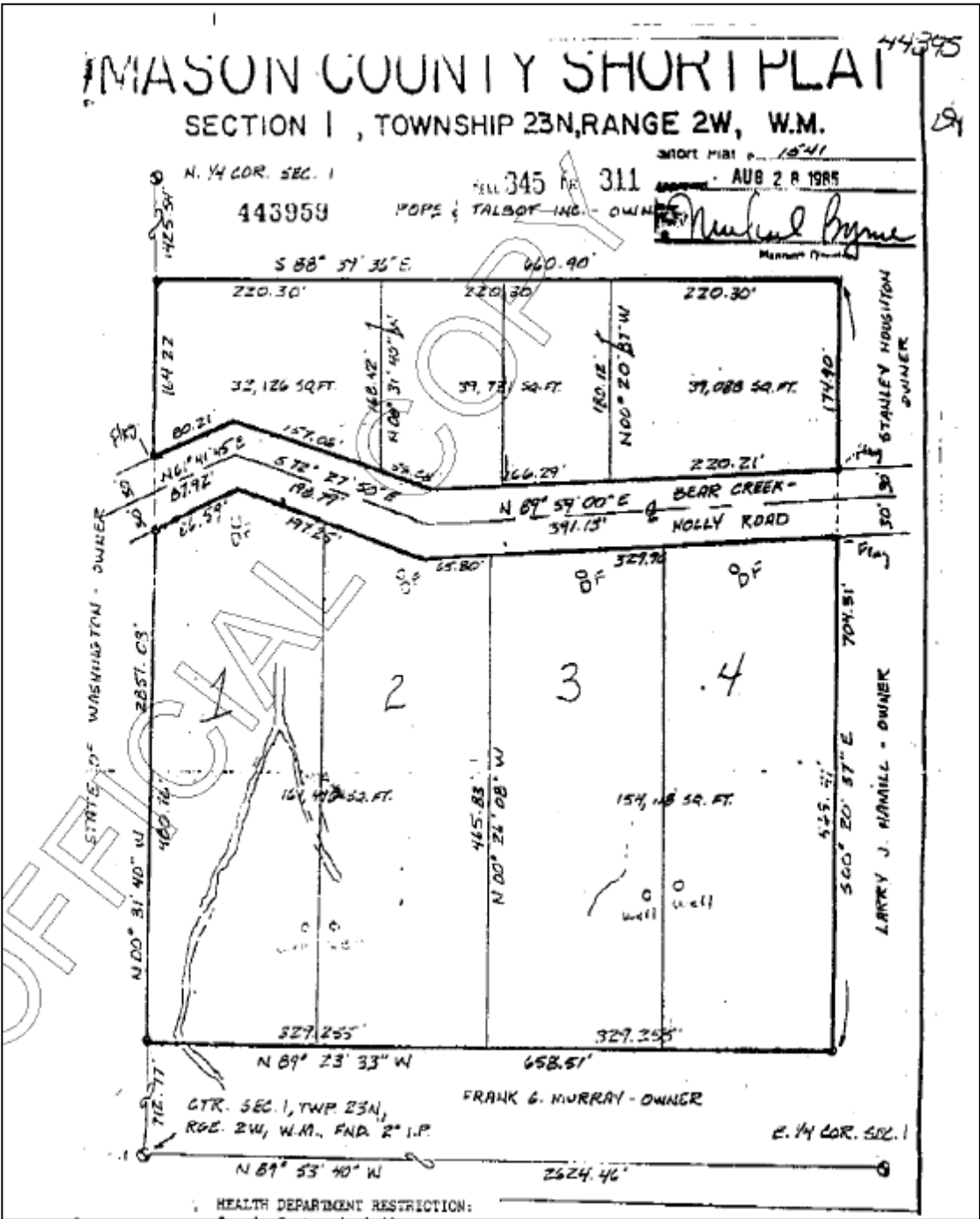
IN 1977 NILS RONHOVDE, PLS, PRODUCED A LARGE LOT SUBDIVISION OF WHAT WAS PURPORTED TO BE THE EAST HALF OF THE SOUTHWEST QUARTER OF THE NORTHEAST QUARTER. THE MAP SHOWS A TIE TO A 2 INCH IRON PIPE AT THE CENTER QUARTER BUT NO OTHER TIES TO MONUMENTS ON THE EXTERIOR OF THE SECTION. HE SET REBARS AND CAPS AT THE LOT CORNERS. RONHOVDE'S SECTION SUBDIVISION APPEARS TO BE BASED ON THE AFOREMENTIONED DNR RIGHT OF WAY PLAT AS HIS DIMENSIONS PRECISELY MATCH THAT MAP. HIS BASIS OF BEARING IS NOT CLEAR BECAUSE HIS BEARINGS DIFFER SLIGHTLY AND IT DOES NOT APPEAR THAT HE TIED THE NORTH OR EAST QUARTER CORNERS, BUT HE APPARENTLY ASSUMED THE PIPE REPRESENTED THAT CALCULATED CENTER QUARTER POSITION.

From the survey narrative:

IN 1985, BUILDING ON HIS 1977 LARGE LOT PLAT, RONHOVDE FILED TWO SEPARATE SHORT PLATS CREATING LOTS IN THE NORTHWEST QUARTER OF THE SOUTHWEST QUARTER OF THE NORTHEAST QUARTER. HIS SURVEY SET A REBAR AND CAP FOR THE CENTER-NORTH SIXTEENTH (C-N1/16) ALONG WITH OTHER LOT CORNERS. THE SHORT PLATS SHOW THE NORTH AND EAST QUARTER CORNERS BUT AGAIN IT APPEARS THAT THOSE CORNERS WERE NOT TIED AS THE DISTANCES GIVEN PRECISELY MATCH THE RIGHT OF WAY PLAT AND DIFFER FROM THE CONTEMPORARY MEASURED DISTANCES BY 38 FEET AND 48 FEET RESPECTIVELY.



The Large Lot Subdivision and Short Plat used the DNR foresters' center quarter corner pipe and the erroneous dimensions shown on the Overland Trail Road right of way plat.



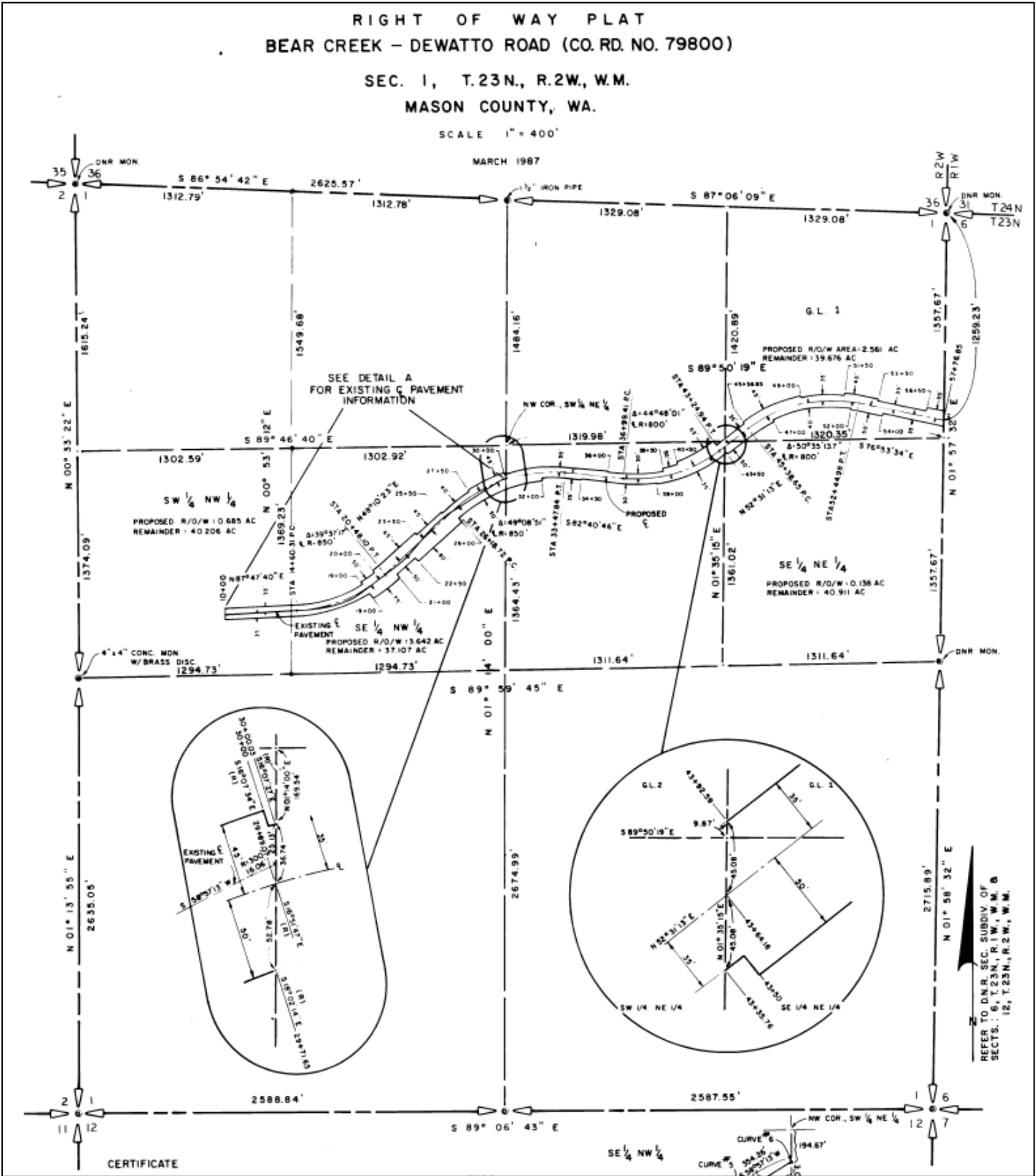
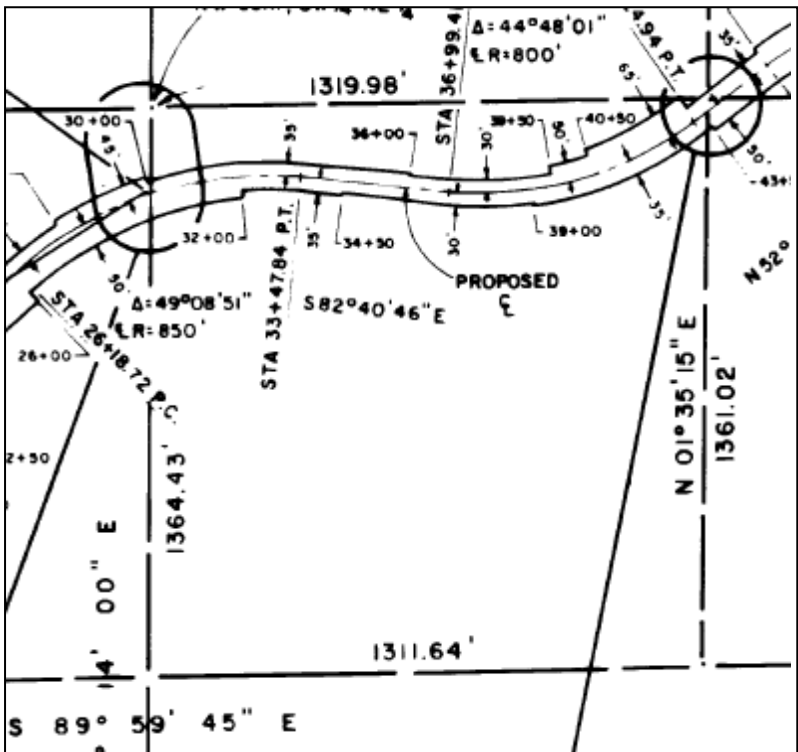
Mission Bearable – Center Quarter Corner Bamboozlement

Section 1, T23N, R2W, Willamette Meridian

From the survey narrative:

IN 1987, M. R. PAZOOKI, PLS, FILED A RIGHT OF WAY PLAT FOR A PORTION OF THE BEAR CREEK – DEWATTO ROAD. THAT PLAT DID NOT SHOW OR USE THE PIPE AS THE CENTER OF SECTION. PAZOOKI'S SUBDIVISION OF THE SECTION ALSO PROPERLY CALCULATED THE CENTER OF SECTION.

The 1987 right of way plat finally subdivides the section correctly. The C-N 1/16 corner was calculated using a parenthetical distance of 21.755 chains between the C-N 1/16 and the north quarter corner, which is a mean of the parenthetical distances along the east and west section lines. Using the acreages shown on the GLO plat would result in a parenthetical distance of 21.725 instead of 21.755, a difference of three links.



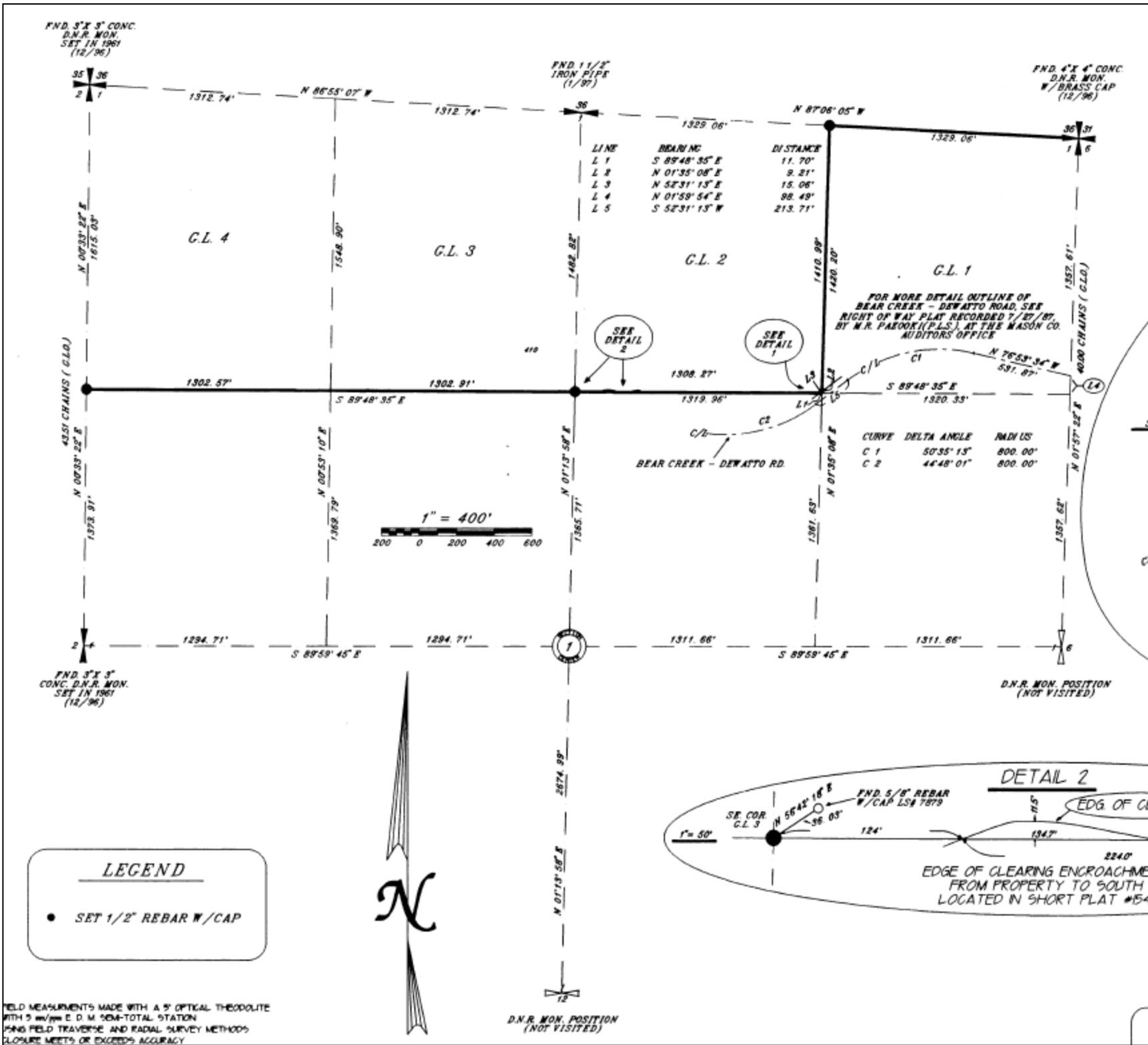
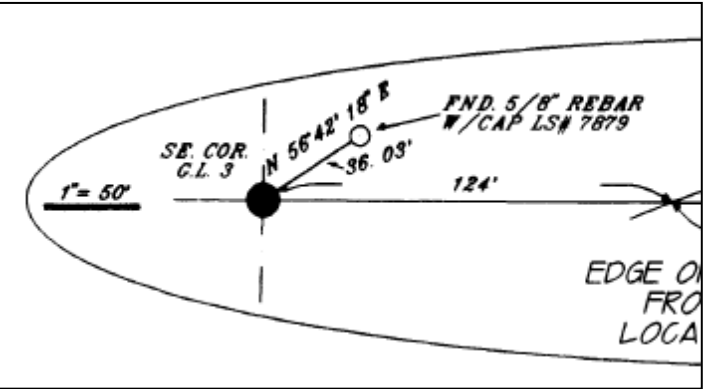
Mission Bearable – Center Quarter Corner Bamboozlement

Section 1, T23N, R2W, Willamette Meridian

From the survey narrative:

ALSO IN 1997, MICHAEL J. ANDERSON RECORDED A SURVEY FOR POPE RESOURCES WHICH AGAIN CALCULATED THE CENTER OF SECTION BY THE PROPER METHOD. ANDERSON DID NOT SET A MONUMENT FOR, OR SHOW A PIPE IN THE VICINITY OF, THE CENTER QUARTER. ANDERSON'S SURVEY REJECTED RONHOVDE'S C-N 1/16 REBAR SHOWING IT N 56°42'18" E, 36.03 FEET FROM ANDERSON'S CALCULATED POSITION WHERE HE SET A REBAR AND CAP. ANDERSON ALSO SET REBARS AT THE N 1/16 ON THE WEST LINE, THE E 1/16 ON THE NORTH LINE AND TWO LINE MONUMENTS IN THE VICINITY OF THE NE 1/16.

This 1997 survey set a monument for the C-N 1/16 corner, using a parenthetical distance of 21.715 chains, which is one link different from the parenthetical as derived from the adjacent lot acreages and 4 links different from a mean of the east and west section lines. From the bearings shown on the survey, it is possible that the C-N 1/16 corner was located at an intersection of the lines connecting the north and south quarter corners and the north 1/16 corners on the east and west section lines. Such a subdivision method is improper and it may be mere coincidence that the resulting location is closely consistent with one of the alternative parenthetical distances. The survey shows a distance of 36.03 feet to the monument for the C-N 1/16 corner set for the 1985 short plat.



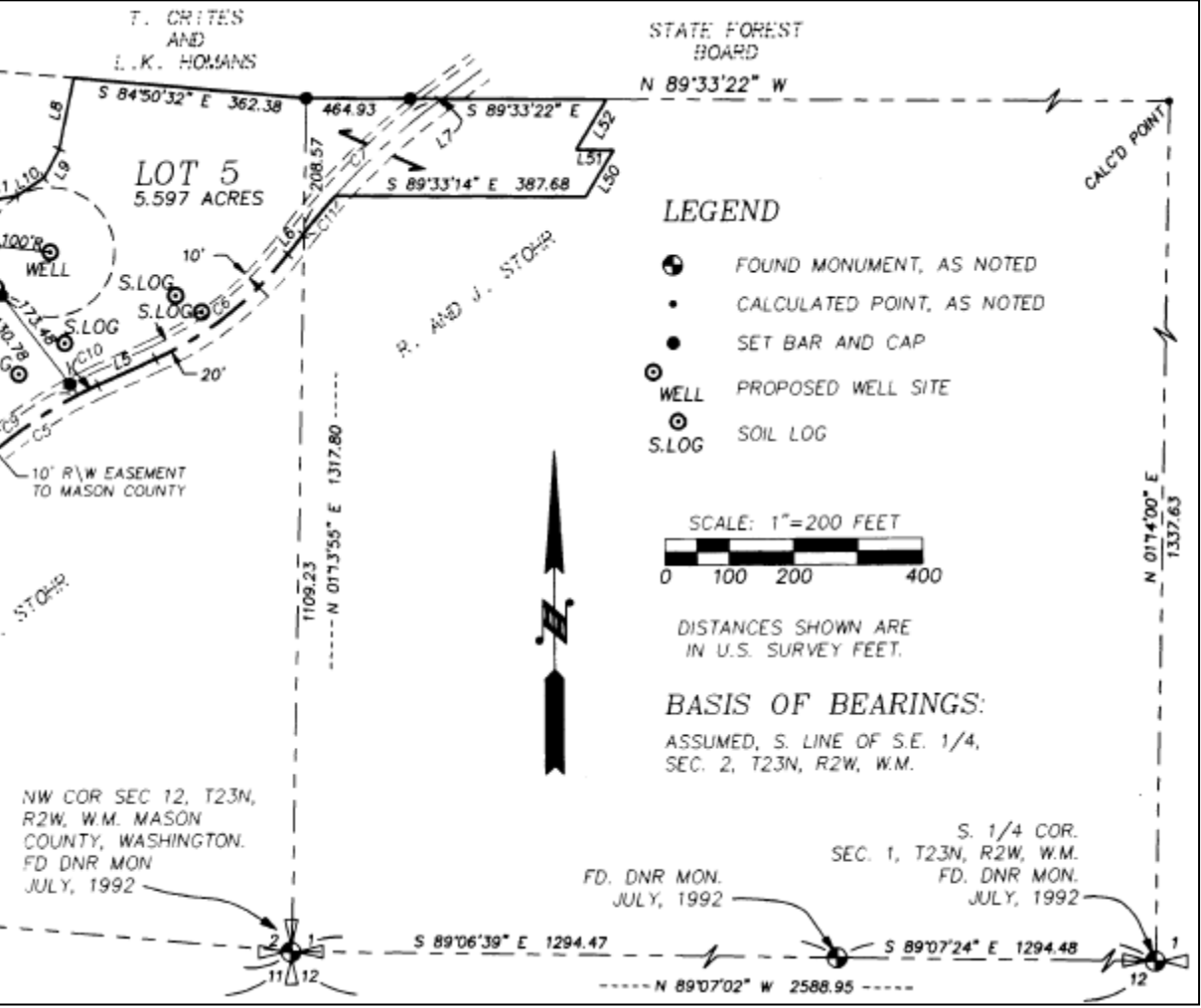
Mission Bearable – Center Quarter Corner Bamboozlement

Section 1, T23N, R2W, Willamette Meridian

From the DNR survey narrative:

IN 1997, MICHAEL N. SPROUFFSKE, PLS, FILED A SURVEY WHICH INDICATES THAT HE ALSO USED A CALCULATED INTERSECTION POSITION FOR THE CENTER QUARTER.

The dimensions show in this 1997 survey are consistent with a location of the center quarter corner at an intersection of lines connecting opposite quarter corners and not consistent with the location of the DNR foresters' iron pipe.



Mission Bearable – Center Quarter Corner Bamboozlement

Section 1, T23N, R2W, Willamette Meridian

From the DNR survey narrative:

IN 2001, KEVIN D. BLUHM, PLS, FILED A SURVEY SHOWING AN IRON PIPE S 49°12'06" E 62.59 FEET FROM HIS CALCULATED CENTER QUARTER INTERSECTION POSITION. BLUHM DID NOT MONUMENT THE CALCULATED POSITION BUT FURTHER SUBDIVISION OF THE SECTION WAS DONE USING THE CALCULATED POSITION. BLUHM'S SURVEY ALSO SET REBARS AND CAPS AT THE C-S-NE 1/64, THE SE-NE 1/64 AND THE C-E-E 1/64 CORNERS.

C1/4 COR. SEC. 1
CALC. PER REF. SURVEY #1
S49°12'05"E 62.59' TO
FOUND IRON PIPE

C-N 1/16
8-2-01 FND 1/2" REBAR
W/CAP LS 27665

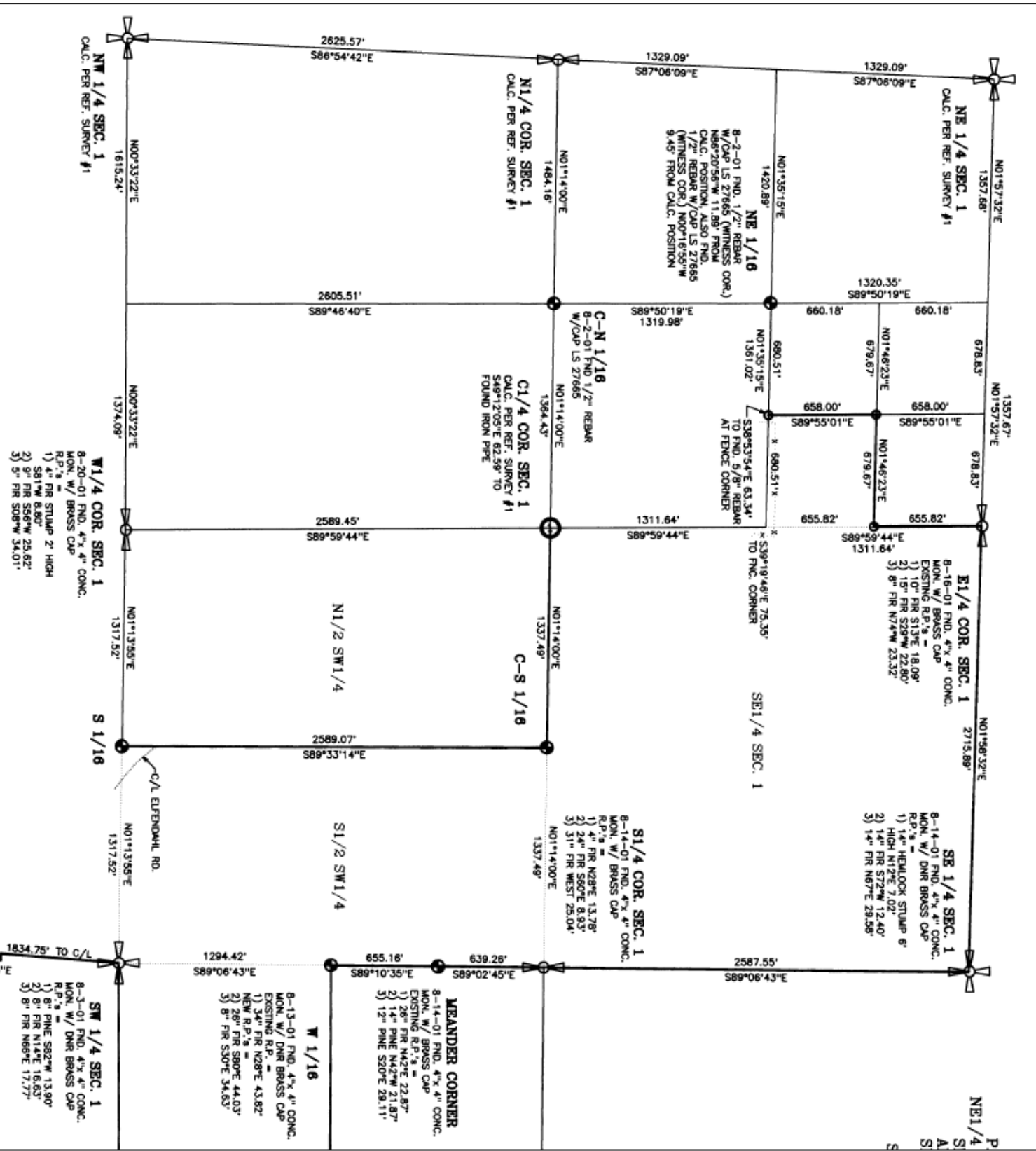
NE 1/16
8-2-01 FND. 1/2" REBAR
W/CAP LS 27665 (WITNESS COR.)
N86°20'56"W 11.89' FROM
CALC. POSITION, ALSO FND.
1/2" REBAR W/CAP LS 27665
(WITNESS COR.) N00°16'55"W
9.45' FROM CALC. POSITION

C-E 1/16 Corner

S39°19'46"E 75.35'
TO FNC. CORNER

The last paragraph of the DNR survey narrative explains the reasons for not accepting the DNR foresters' location of the Center Quarter Corner.

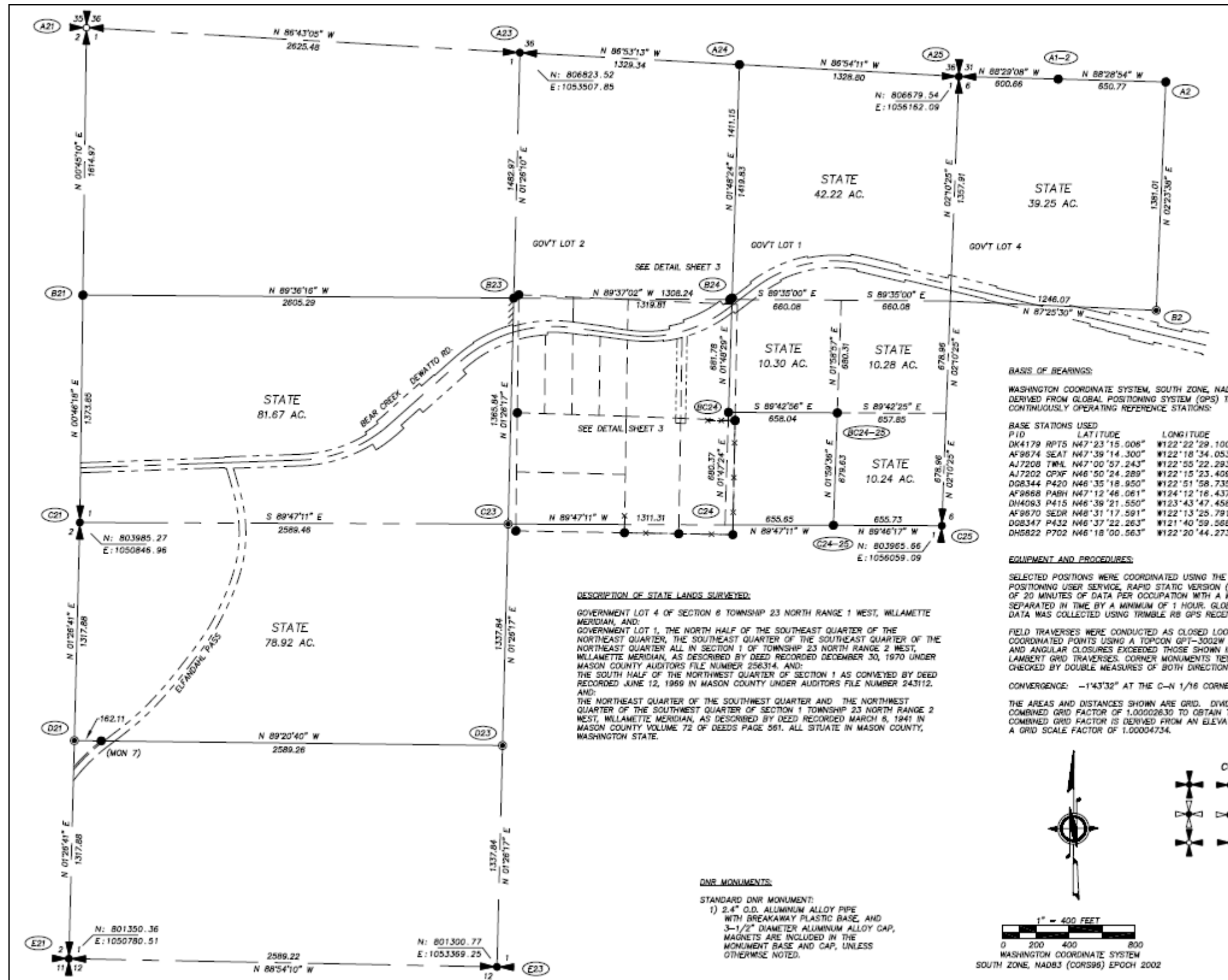
THE PIPE PURPORTED BY NILS RONHOVDE TO REPRESENT THE CENTER QUARTER WAS SET WITH SIGNIFICANT ERROR USING AN IMPROPER METHOD BY PERSONS LACKING LEGAL AUTHORITY. RONHOVDE, THE ONLY SURVEYOR TO USE THE PIPE, APPARENTLY FAILED TO VALIDATE ITS POSITION BY MEASUREMENTS TO ANY MONUMENTS ON THE EXTERIOR OF THE SECTION. ACCEPTING THE PIPE WOULD REQUIRE REJECTION OF THE POSITION SHOWN ON RIGHT OF WAY PLAT PRODUCED PRIOR TO RONHOVDE'S SURVEY AND FOUR SUBSEQUENT SURVEYOR'S SUBDIVISION OF THE SECTION. FOR THESE REASONS THIS SURVEY DOES NOT ACCEPT THE FOUND PIPE AS REPRESENTING THE CENTER QUARTER OF SECTION 1.



Mission Bearable – Center Quarter Corner Bamboozlement

Section 1, T23N, R2W, Willamette Meridian

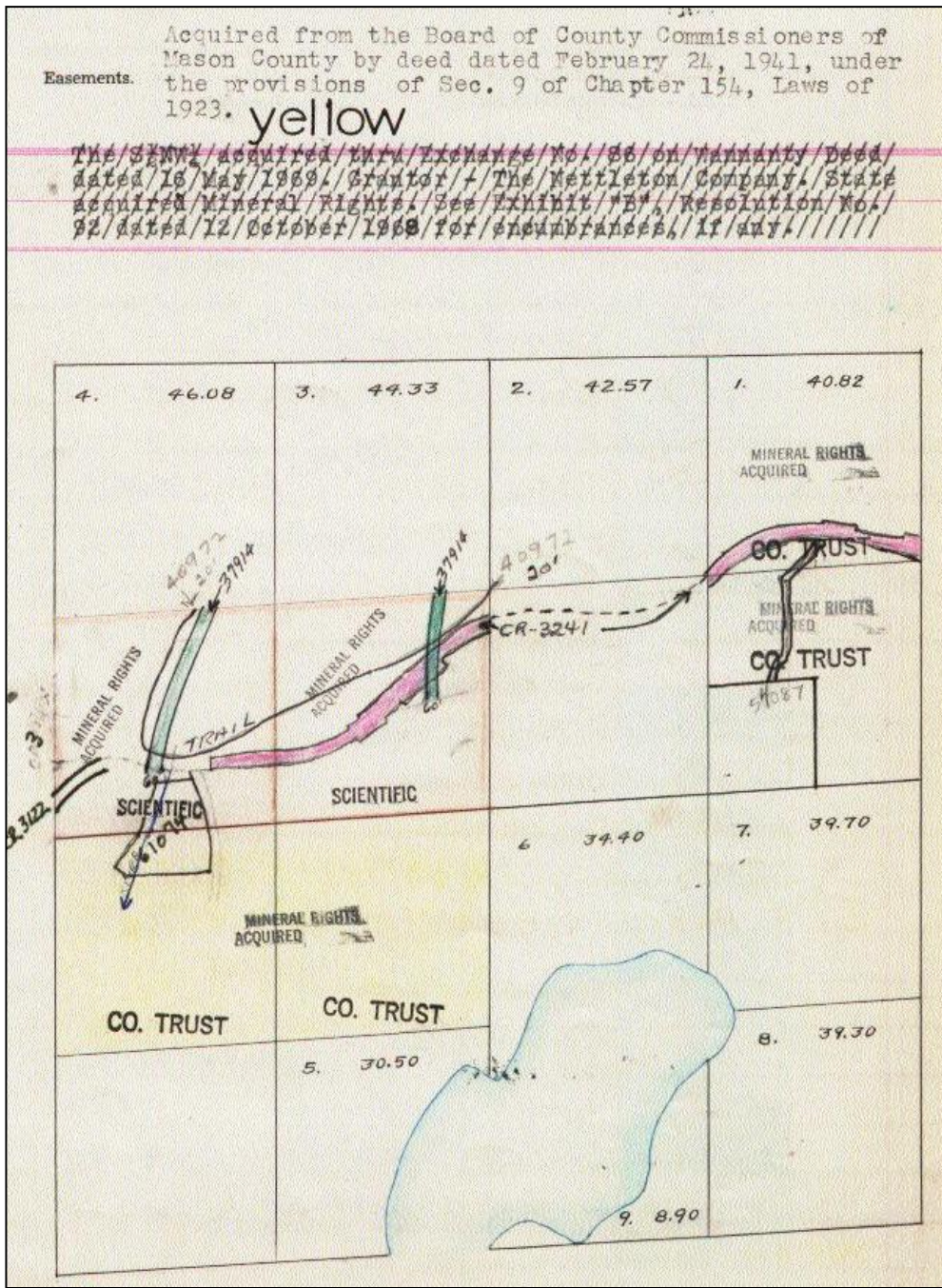
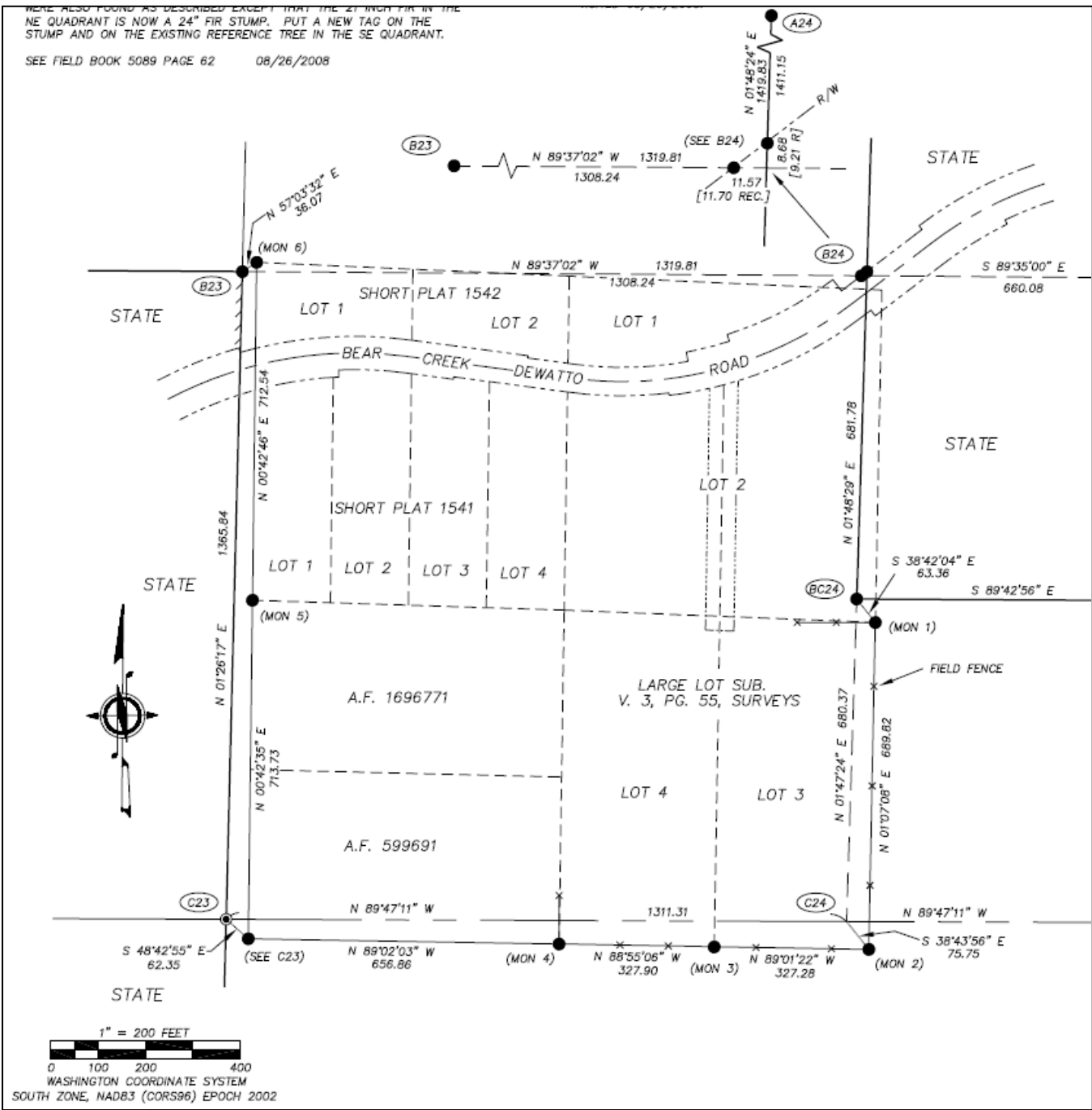
The DNR 2008 survey



Mission Bearable – Center Quarter Corner Bamboozlement

Section 1, T23N, R2W, Willamette Meridian

There is an overlap between the 1977 Large Lot Subdivision and State lands determined by corners set by the 2001 private survey using proper section subdivision procedures. Since the State acquired the land in 1941 from Mason County it is assumed that no adverse possession rights could have been ripened by reliance on the corners set for the Large Lot Subdivision.



Section 16, T36N, R43E, Willamette Meridian

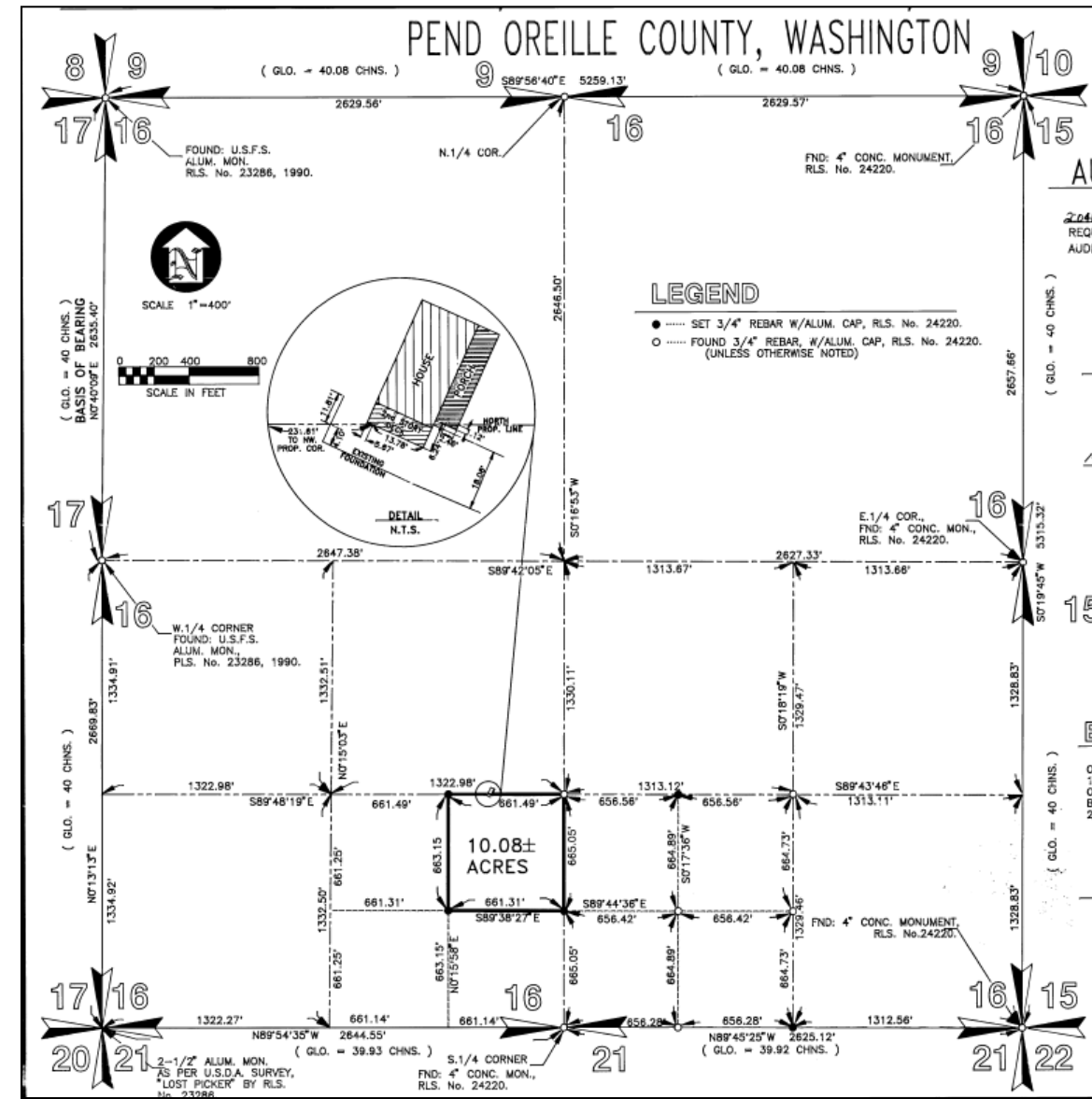
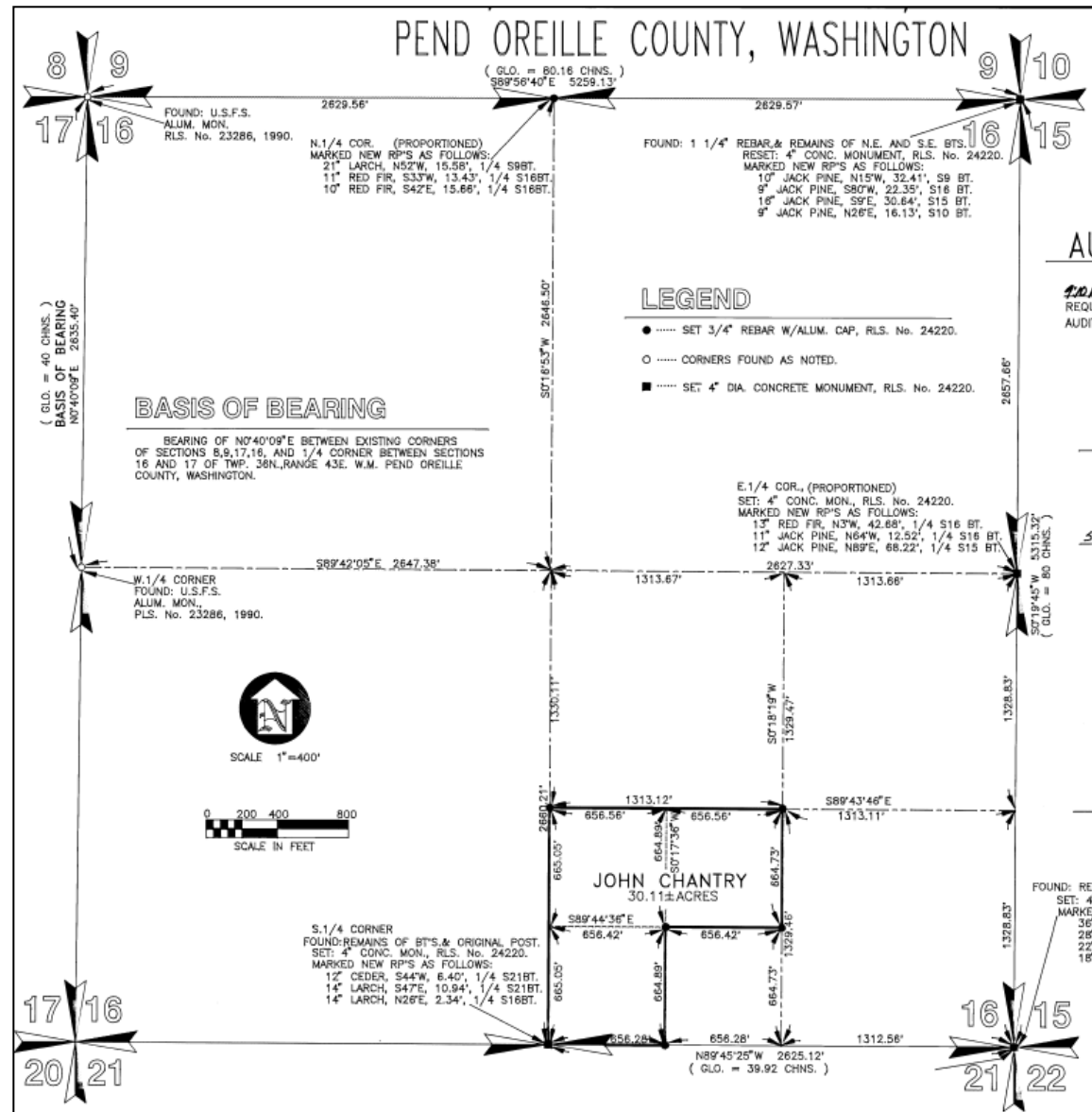
[illegible]

6-1

Lost Creek – Cut and Run


Section 16, T36N, R43E, Willamette Meridian

In 1993 and 1994 a private surveyor performed two surveys in Section 16. The house encroachment is not on State land but on another private parcel.



Lost Creek – Cut and Run

Section 16, T36N, R43E, Willamette Meridian



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240

March 7, 1988

IN REPLY REFER TO:
9620 (720)

Instruction Memorandum No. 88-287
Expires 9/30/89

To: State Directors

From: Director

Subject: Establishment of Minor Subdivision Corners


Fifth: "6-28. Once it is accepted, a local point of control has all the authority and significance of an identified original corner. The influence of such points is combined with that of the previously identified original corners in making final adjustments of the temporary points. The surveyor must therefore use extreme caution in adopting local points of control. These may range from authentic perpetuations of original corners down to marks which were never intended to be more than approximations. When a local reestablishment of a lost corner has been made by proper methods

without gross error and has been officially recorded, it will ordinarily be acceptable. Monuments of unknown origin must be judged on their own merits, but they should never be rejected out of hand without careful study. The age and the degree to which a local corner has been relied on by all affected landowners may lead to its adoption as the best remaining evidence of the position of the original corner. The surveyor must consider all these factors. However, he cannot abandon the record of the original survey in favor of an indiscriminate adoption of points not reconcilable with it.

The field-note record of the resurvey should clearly set forth the reasons for the acceptance of a local point where it is not identified by actual marks of the original survey. Recognized and acceptable local marks will be preserved and described. Where they are monuments of a durable nature, they are fully described in the field notes and a full complement of the required accessories recorded, but without disturbing or re-marking the existing monument. New monuments are established if required for permanence, in addition to, but without destroying the evidence of the local marks."

This section is interpreted, by this office, to pertain both to the reestablishment of lost corners and to the establishment/reestablishment of minor subdivision corners.

A 1988 BLM memorandum from the Washington, D.C., office and a 1987 Oregon State Office memorandum discuss the importance of locally established corners. The national memo indicates that local corners can be used to establish or reestablish both lost corners and lost minor subdivision corners. The Oregon State memo indicates a reluctance to use aliquot part corners, minor subdivision corners, as a basis for reestablishing lost original corners. There is room for interpretation as to the application of these principles. The surveys on the previous page give a subsequent surveyor an opportunity to explore various interpretations of these principles.



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
OREGON STATE OFFICE
P.O. Box 2965 (825 NE Multnomah Street)
Portland, Oregon 97208

February 27, 1987

IN REPLY REFER TO:
9600 (942)

Instruction Memorandum No. OR-87- 274
Expires 9/30/88

To: All District Managers

From: State Director

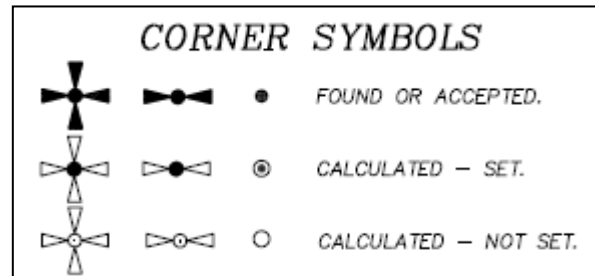
Subject: Acceptance of Locally Established Survey Corners

It is important to differentiate between establishing aliquot part corners and reestablishing lost original corners. Normally, local corners and records will not be used as a basis for reestablishing lost original corners by

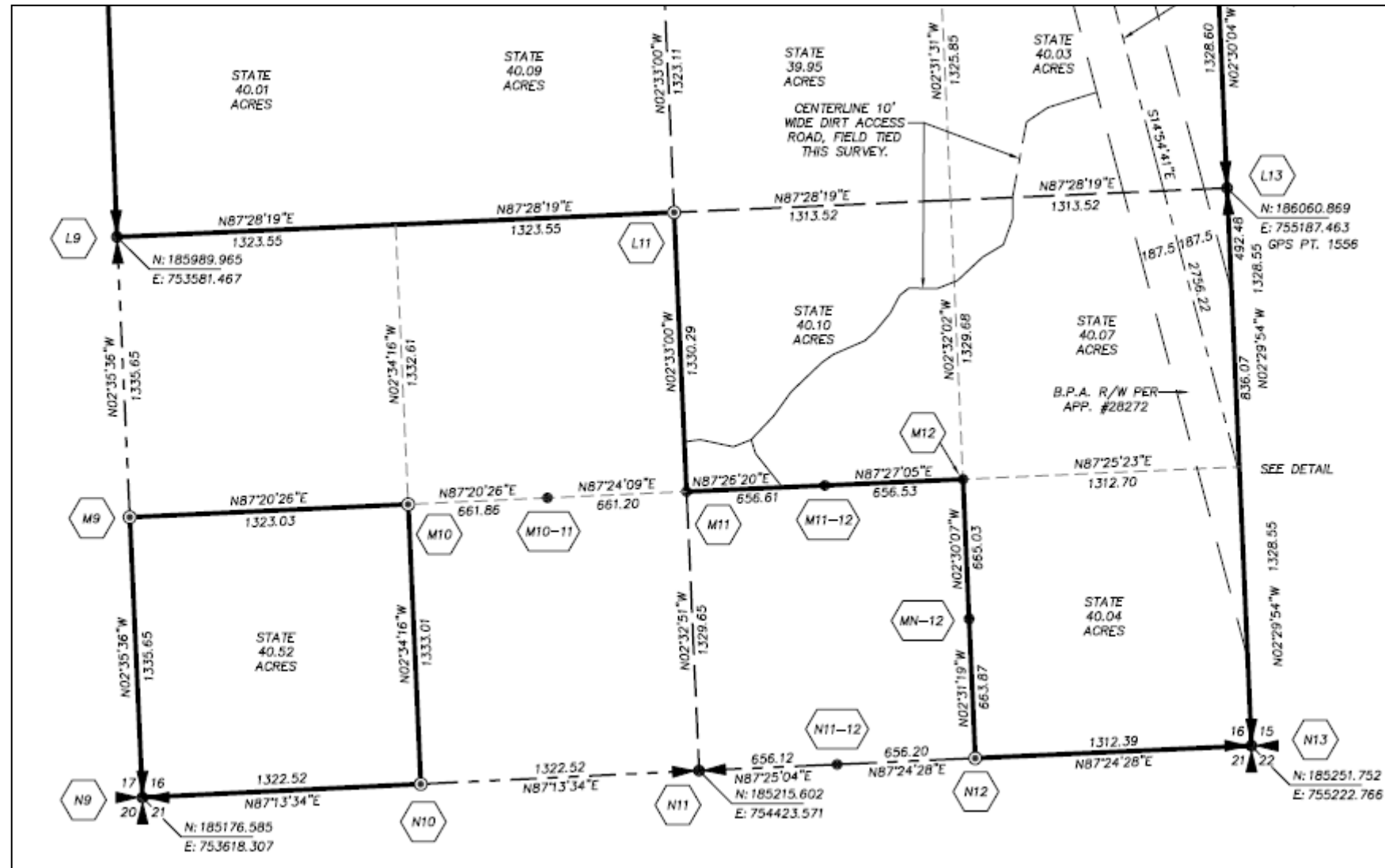
proportionate measurement. However, when a careful and thorough examination concludes that it is the best available evidence to determine the position of the original corner, it may be used. Before a decision is made, the situation should be fully discussed with the Chief, Field Section, Branch of Cadastral Survey.

Lost Creek – Cut and Run

Section 16, T36N, R43E, Willamette Meridian



In the 1997 DNR survey several 1/16 and 1/64 corners were accepted and used to control both line and distance. The SW 1/16 corner was located using the existing C-E-SW 1/64 corner to control the alignment of the E-W centerline of the SW quarter section. The existing E 1/16 corner on the south section line was found to be set in the wrong location by the previous survey. The E 1/16 corner was located by using the W-E 1/64 corner both for alignment and distance proportion.

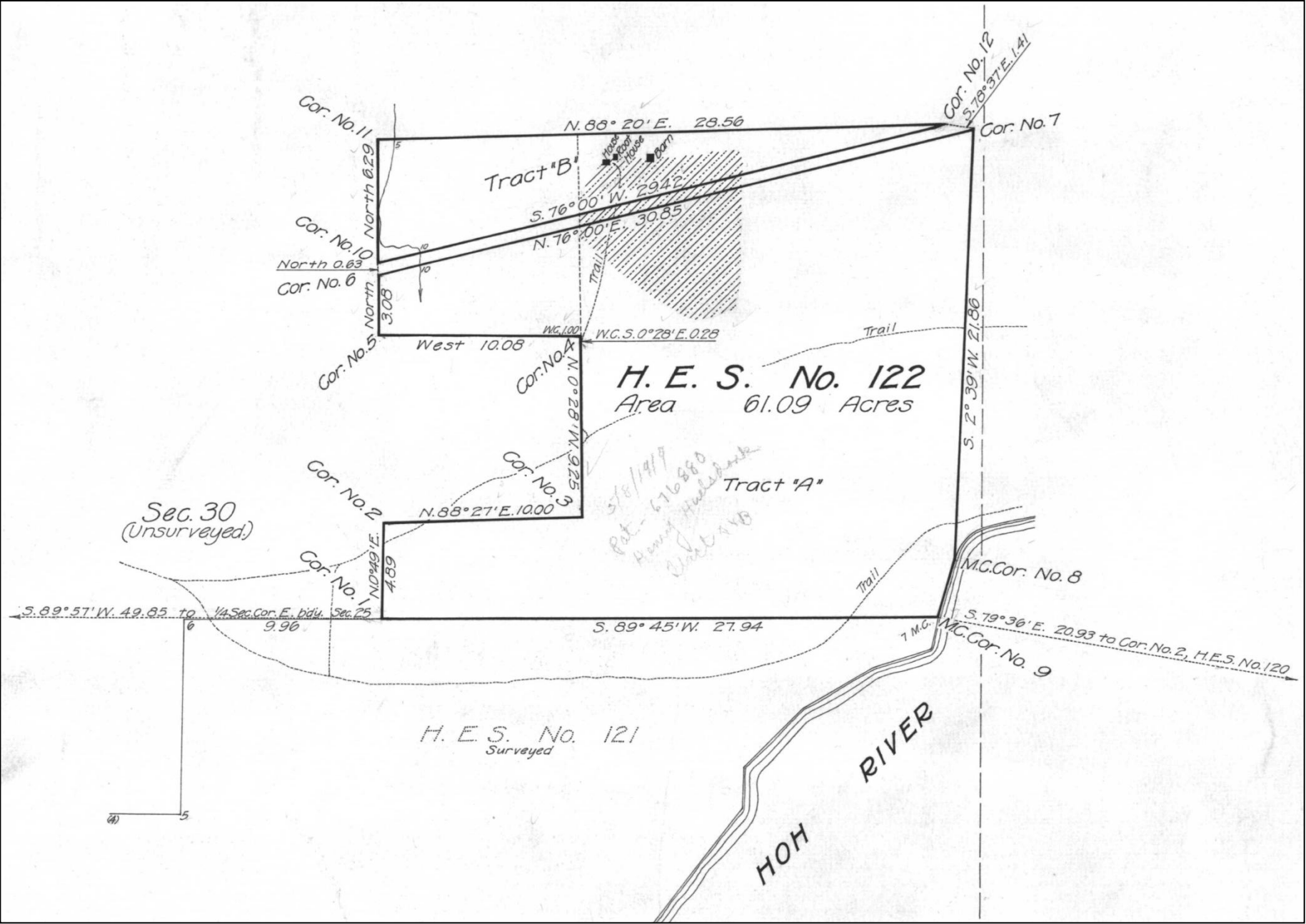


Old Goat – Homestead Entry Survey Retracement

Sections 29 and 30, T27N, R10W, Willamette Meridian

In 1895 GLO Surveyor Edward A. Fitzhenry surveyed the east boundary of T27N, R11W. In 1915 Forest Service Surveyor George W. Root surveyed H.E.S. 121 and 122 in unsurveyed Section 30 of T27N, R10W. Root connected the H.E.S. survey to the 1/4 section corner on the 1885 range line.

Surveys Designated	By whom Surveyed	Inst., Cont., Group		When Surveyed		Date of Approval
		No.	Date	Began	Completed	
H. E. Survey No. 122	Geo. W. Root		March 19, 1914. Jan. 29, 1916.	Aug. 20, 1915.	Aug. 24, 1915.	Nov. 20, 1916
H. E. Survey No. 121	" " "		March 19, 1914.	Aug. 14, 1915.	Aug. 20, 1915.	Nov. 20, 1916
	Surveyor - Forest Service.					
E. bdy. T. 27N, R. 11W.	Edward A. Fitz Henry	461	May 15, 1895	June 22, 1895	Aug. 17, 1895	Dec. 1, 1896

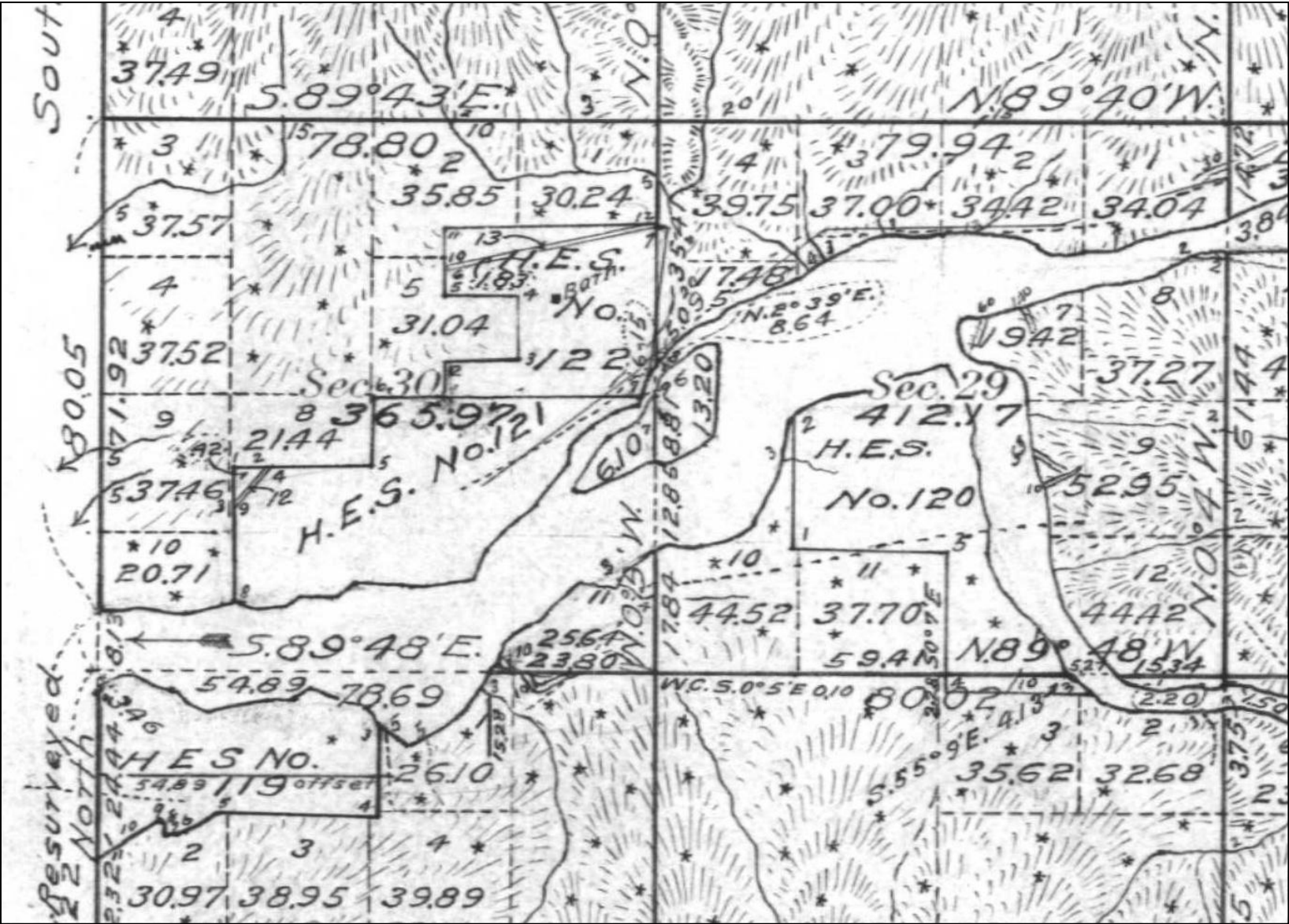


Old Goat – Homestead Entry Survey Retracement

Sections 29 and 30, T27N, R10W, Willamette Meridian

In 1916, GLO Surveyors John L. Warboys and Roy T. Campbell subdivided T 27N, R10W, and segregated the Homestead Entry Surveys from the lots and aliquot parts of the sections created. The township subdivision revealed that H.E.S. 122 was partially in Section 29.

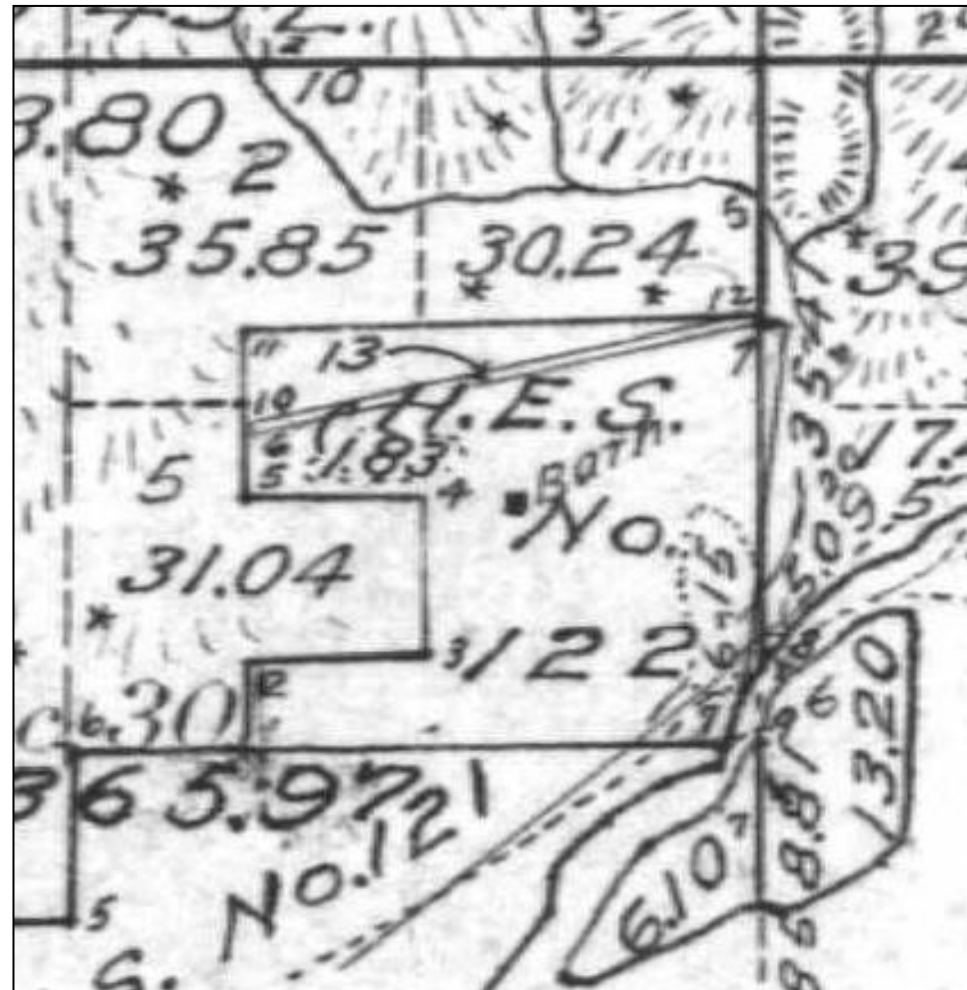
Surveys Designated	By Whom Surveyed	Group		Amount of Surveys			When Surveyed	
		No.	Date	Mls.	chs.	lks.	Begun	Completed
West Boundary Res.	John L. Warboys	25	Sept. 15, 1916	3	45	86	June 23, 1918	Sept. 9, 1919
Subdivisions	and	"	" " "	59	56	50	" 28 "	June 25, "
Meanders	Roy T. Campbell	"	" " "	27	9	82	July 1 "	Nov. 11, 1918
N. S. and E. Boundaries	"	"	" " "				June 25, "	May 25, 1919
West Boundary	E. A. Fitz Henry	Conf. 461	May 15, 1895				" 24, 1895	June 26, 1895
Connections	Warboys and Campbell	25	Sept. 15, 1916		46	81	July 12, 1918	Oct. 8, 1918



Old Goat – Homestead Entry Survey Retracement

Sections 29 and 30, T27N, R10W, Willamette Meridian

The field notes of the township subdivision note the point of intersection of the section line with the line connecting corners 7 and 8 of H.E.S. 122. There is not mention of a closing corner monument.



From the point for cor. of secs. 29, 30, 31, and 32,
N. 0° 5' W., bet. secs. 29 and 30.
South 15.00 chs.; then on offset line West.
Over dry bed of stream.

40.00 Point for $\frac{1}{4}$ sec. cor. falls in Hoh River.

44.59 Right bank of Hoh River.

Set an iron post, 3 ft. long, 1 in. dia., 26 ins. in the ground, for meander cor. of fract. secs. 29 and 30, with brass cap mkd.

T 27 N R 10 W S 30 S 29

51.66' Intersect line 7-8 of Homestead Entry Survey 122, N. 2°
39' E. 8.64 chs. dist. from cor. No. 8.
59.65 SE. cor. of Henry Huelsdonk barn bears N. 75° W. 15.50
chs. dist.

80.00 Set an iron post, 3 ft. long, 2 ins. dia., 24 ins. in
the ground, for cor. of secs. 19, 20, 29, and 30, with
brass cap mkd.

T 27 N	R 10 W
S 19	S 20
S 30	S 29

1918

Sections 29 and 30, T27N, R10W, Willamette Meridian

LEGEND

- ⊙ Denotes found monument
- ◇ Denotes calculate corner

Jefferson County

T 27 N, R.10 West., W.M.

Segregated Surveys:

Name: _____ Corner No.: _____
DLC, HES, Tract, Mining Claim, Indian Allotment, Federal Reserve, Townsite.

1. History of Corner Establishment and Subsequent Restoration:

Iron pipe and brass cap set for closing corner in 1918 by GLO. NOTE: GLO notes do not refer to any corner set or list any BTs. The notes read; "at 51.66 chains intersect line 7-8 in HES 122 N2³⁹E at 8.64 chains from corner #8".

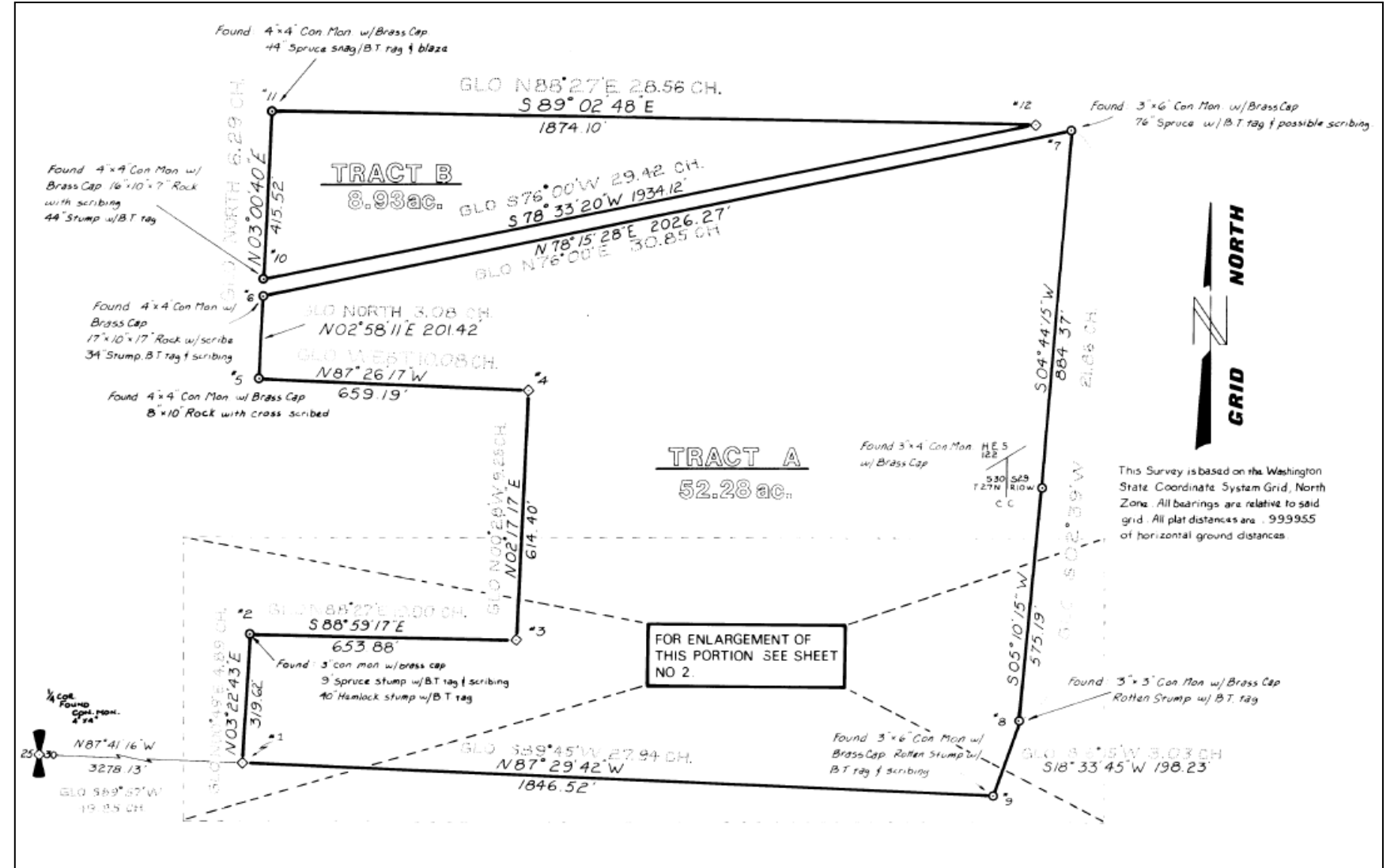
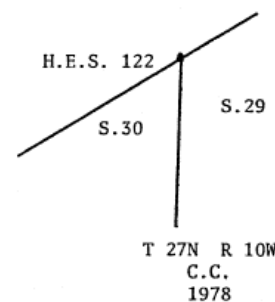
2. Description of Evidence Found:

Iron pipe with brass cap attached set in 1918 presumably by GLO. I replace pipe with monument and bury pipe along side.

3. Describe Monument, Accessories and Corollary Data to Perpetuate this Corner Location. Diagram corner and indicate meridian and reference to map of record. Surveyor's Field Book No. _____ Page No. _____ Date of work 7/20/78

I set standard DNR 3" cylindrical concrete monument with brass cap and proper corner identification from which bears;

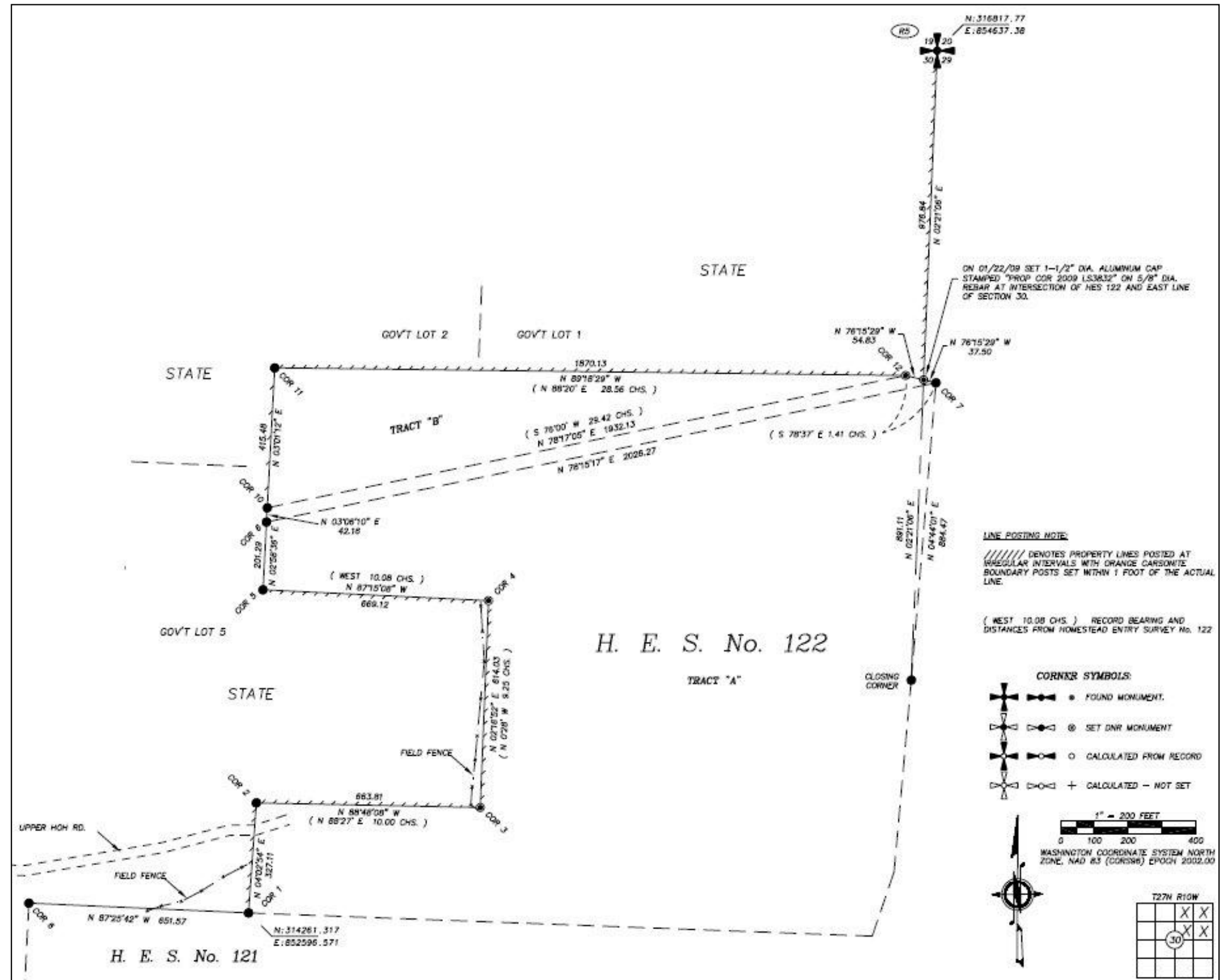
RP 26" maple, alive, tag, N31⁰W, 21.22'
RP 28" maple, alive, tag, N16¹/₂⁰E, 19.97'



Old Goat – Homestead Entry Survey Retracement

Sections 29 and 30, T27N, R10W, Willamette Meridian

An April, 2009, DNR survey accepted the closing corner position as being an angle point of the section line. The line between H.E.S. corners 7 and 8 is not a State boundary and so there was no need to determine whether the closing corner is on or off the boundary of H.E.S. 122. H.E.S. corner number 1 had been restored by a DNR surveyor in 1991. Lost H.E.S. corners 3 and 4 were restored by the Grant Boundary Method, adjusting the record between found H.E.S. corners 2 and 5. Lost corner 12 was also restored by the Grant Boundary Method, adjusting the record between corners 11 and 7. The record measurement between corners 12 and 10 was not used in the adjustment.



Lestor Eaton Survey – Wheat Fields Near Dayton

Section 36, T10N, R39E, Willamette Meridian

Field Notes of the Survey of the
offsetted 2^d Standard Parallel
North of the Base line through
Ranges Nos 39, 40, 41, & 42 East and
the 3^d Standard Parallel North of
the Base line through Ranges Nos
41, 42, & 43, East of the Willamette
Meridian in the Territory of Washing-
ton by Francis Henry, Deputy Surveyor
under his contract No 75 bearing
date the 25th day of June 1863.

Survey commenced Monday July
13th 1863
Survey completed Wednesday July 29
1863.

Begin at the post the established
corner of Township 9 & 10 North Ranges
38 & 39 East of the Willamette Meridian.

East along the South boundary of
Section 31 T. 10. N. R. 39. E. (Variation 21° E.)

40.00 Set a post in mound of earth for Quarter
Section corner made, trench & pits 150
& drove a charred stake 8 in long

80.00 Set a post in mound of earth for
Corner to sections 31 & 32 - made trench
& pits & drove a charred stake 8 in
long. Land rolling - Soil 2^d rate -

In 1863 GLO Surveyor Francis Henry surveyed the Second Offset Standard Parallel North between Townships 9 and 10 North in Range 39 East. The notes of the township line show that the land was not timbered, as it remains today. All the corners were posts in mounds with pits and no bearing trees. Such corners in such terrain are often lost without a trace and must be restored by proportionate measurement.

East on South Boundary of sec 32.
Variation 21° E.

32.50 Top of bluff bears S.E. & N.W. - Descend

40.00 Set a post in mound of stone for quar-
ter section corner as per instructions 150

44.00 Foot of bluff 250 feet high, enter trench ^{valley}

45.65 The S.W. foot of the Truchet, piece 200 ft
wide, course N.W.

59.50 Enter cornfield, bears S.E. & N.W.

67.25 Leave cornfield. N.E. & S.W.

80.00 Set a post in mound of earth for corner
to sections 32 & 33. Made trench & pits &
drove a charred stake 8 in long - 250
Land in valley level - Soil 1st Rate
Other hills - Soil 2^d & 3^d rate
Timber Pine -

East on South boundary of sec. 33 Feet
Variation 20° 45' E.

44.50 Truchet 75 links wide course N.W.

34.50 A creek 15 " " " N.W.

36.50 Leave Truchet valley - ascends.

39.00 A trail - bears N.W. and S.E.

40.00 Set a post in mound of earth for 100
quarter section corner made trench &
pits & drove a charred stake 8 in long

80.00 Set a post in mound of earth for cor-
ner to sections 33 & 34. Made trench
& pits & drove a charred stake 8 in
long. Land in valley level.

East on South Boundary of sec 34
Variation 21° East

40.00 Set a post in mound of earth for 180
Quarter section corner made trench
& pits & drove a charred stake 8 in long.

80.00 Set a post in mound of earth for
Corner to sections 34 & 35 - made - 150
trench & pits & drove a charred stake
8 in long -
Land hilly - Soil 2^d rate - good grass.

East on South boundary of sec 35.
Variation 21° East

40.00 Set a post in mound of earth for quar- 100
ter section corner made trench
& pits & drove a charred stake 8 in long.

80.00 Set a post in mound of earth for cor- 75
ner to sec 35 & 36 - made -
trench & pits & drove a charred
stake 8 in long.

East on South boundary of sect 36 Feet
Variation 20° 30' East

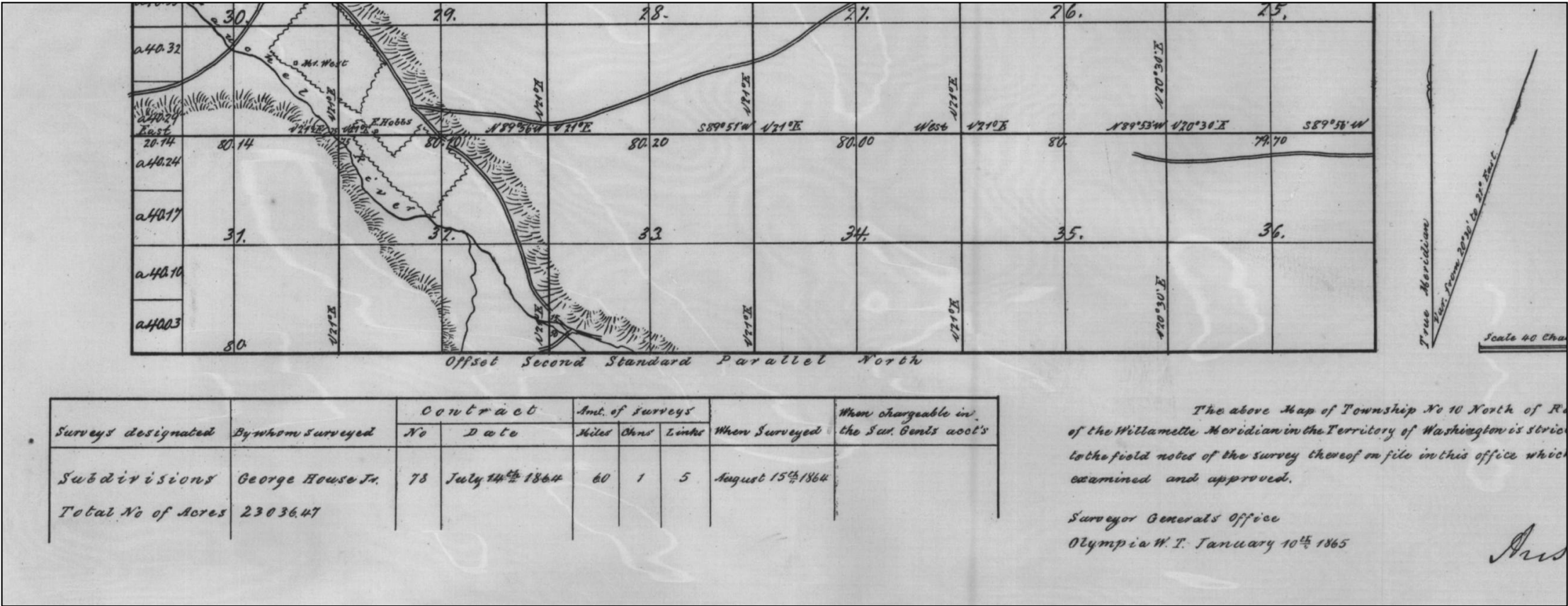
40.00 Set a post in mound of earth for 75
quarter section corner - made trench
& pits & drove a charred stake 8 in long

49.00 A Spring branch 1 link wide course S.W.

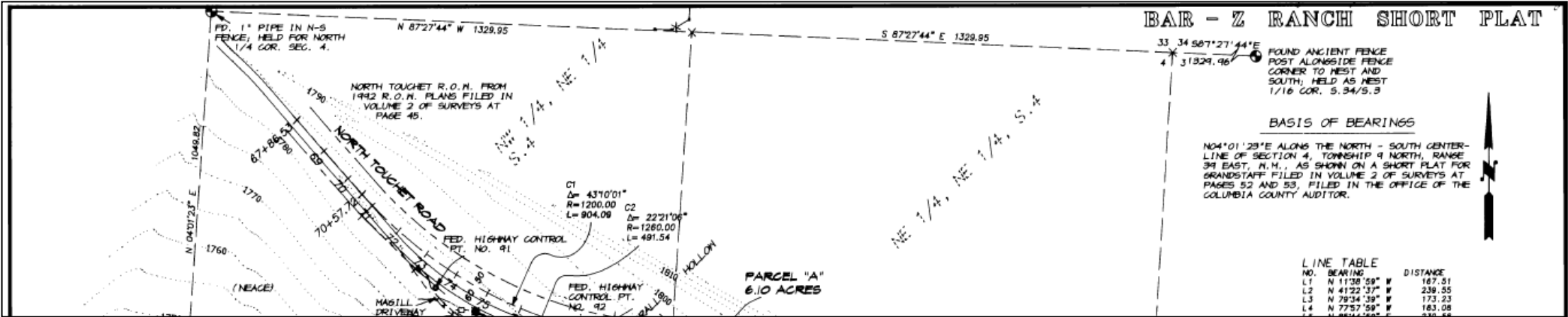
80.00 Set a post in mound of earth for corner
to Townships 10, N. Ranges 39 & 40 E. - 200
made trench & pits & drove a charred
stake 8 in long - Land hilly.
Soil 2^d rate & good grass

Lestor Eaton Survey – Wheat Fields Near Dayton
Section 36, T10N, R39E, Willamette Meridian

In 1864 GLO Surveyor George House subdivided T10N, R39E, creating section 36 which became State school land.

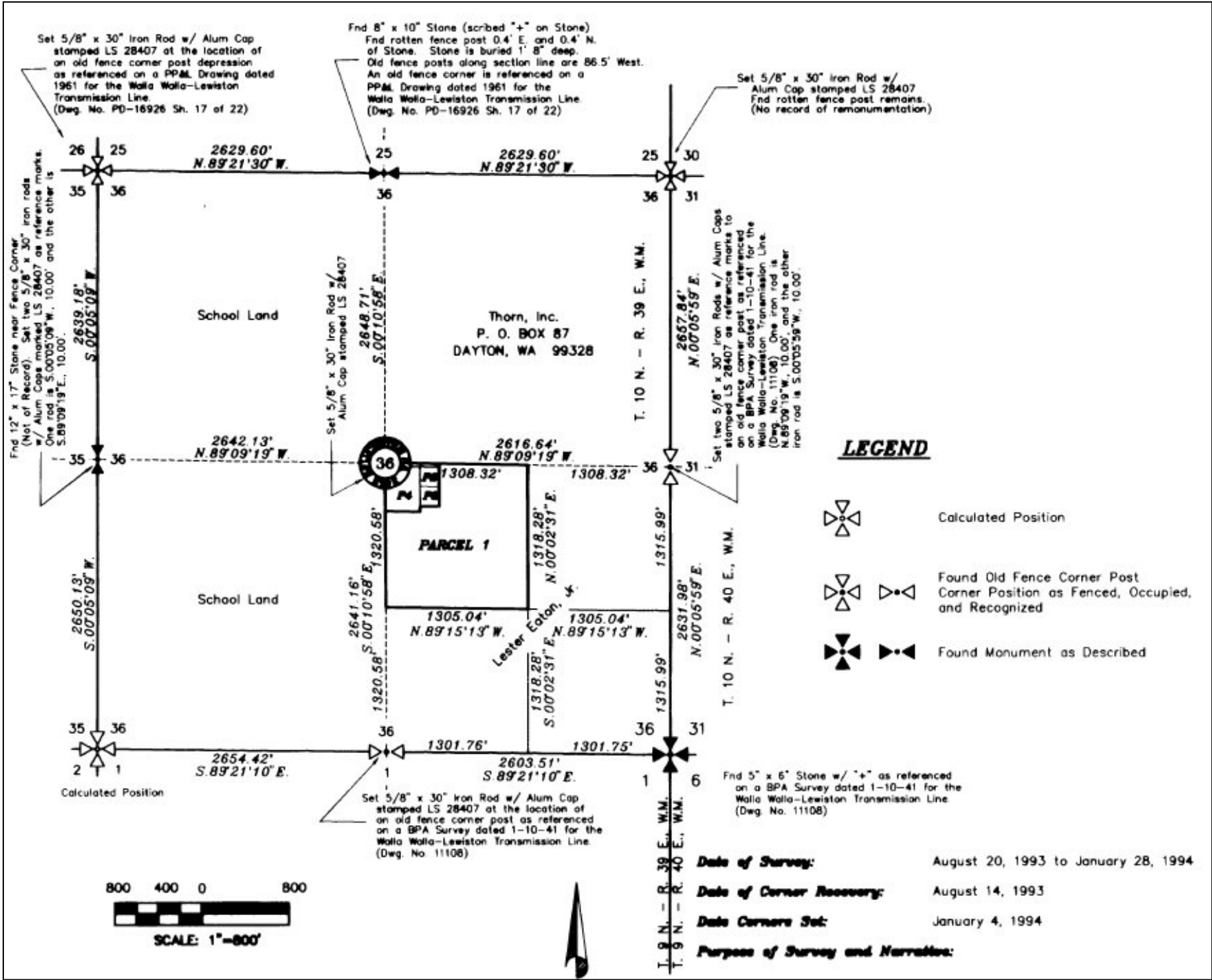


In 1993 a private surveyor held a found pipe in a N-S fence for the quarter corner of Sections 33 and 4 and held an ancient fence post alongside a fence corner as the W 1/16 corner between Sections 34 and 3. The intervening section corner was calculated by single proportion.



Lestor Eaton Survey – Wheat Fields Near Dayton
Section 36, T10N, R39E, Willamette Meridian

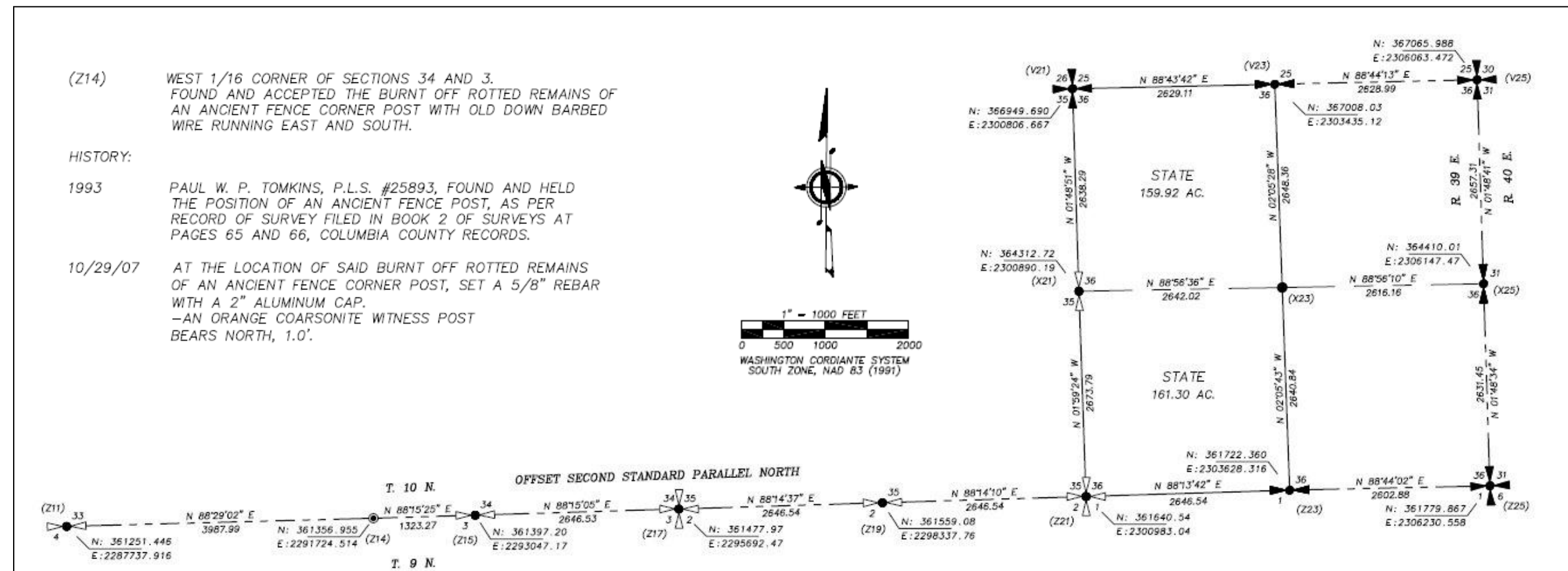
In 1994 a private surveyor calculated the SW corner of Section 36 at a bearing-bearing intersection of the north half of the west line and the east half of the south line of the section. This method of restoring a lost corner is unusual and there is no reason given for using this alternative to the BLM Manual method, a single proportion along the township line.



Lestor Eaton Survey – Wheat Fields Near Dayton

Section 36, T10N, R39E, Willamette Meridian

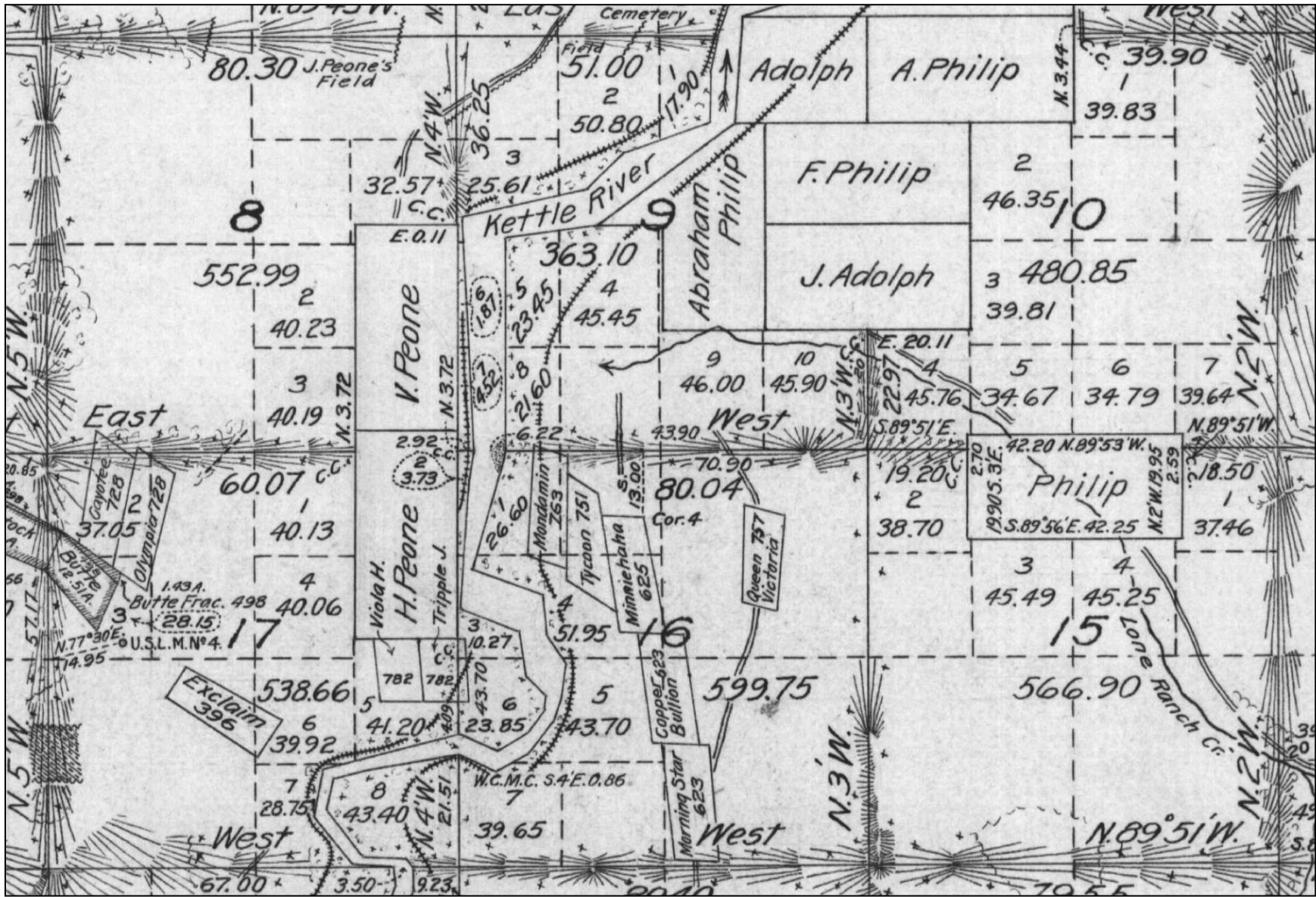
The 2008 DNR survey accepted the 1993 private surveyor's determination that the ancient fence post at the W 1/16 between Sections 34 and 3 must be held to represent a valid corner determination based on the original GLO township line survey. The private surveyor used the 1/16 corner as control for proportioning to the west and the 2008 DNR survey used it to control proportioning to the east. The next found corner to the east is the 1/4 section corner between Sections 36 and 1. The intervening corners are single proportioned for distance with the latitude adjusted to conform to the latitudinal curve. Notice that the distance proportion west and east of the held 1/16 corner are very similar, 1329.33 feet per 20 chains to the east and 1323.27 feet per 20 chains to the west.



Lone Ranch Survey – Maryland Lode, Unsurveyed and Unpatented
Section 16, T40N, R34E, Willamette Meridian

From 1902 to 1906 GLO Surveyor George C. Campbell subdivided T40N, R34E, in Ferry County, segregating many Indian Allotments and Mineral Surveys. The State was entitled to all of Section 16 that was not subject to a mineral claim.

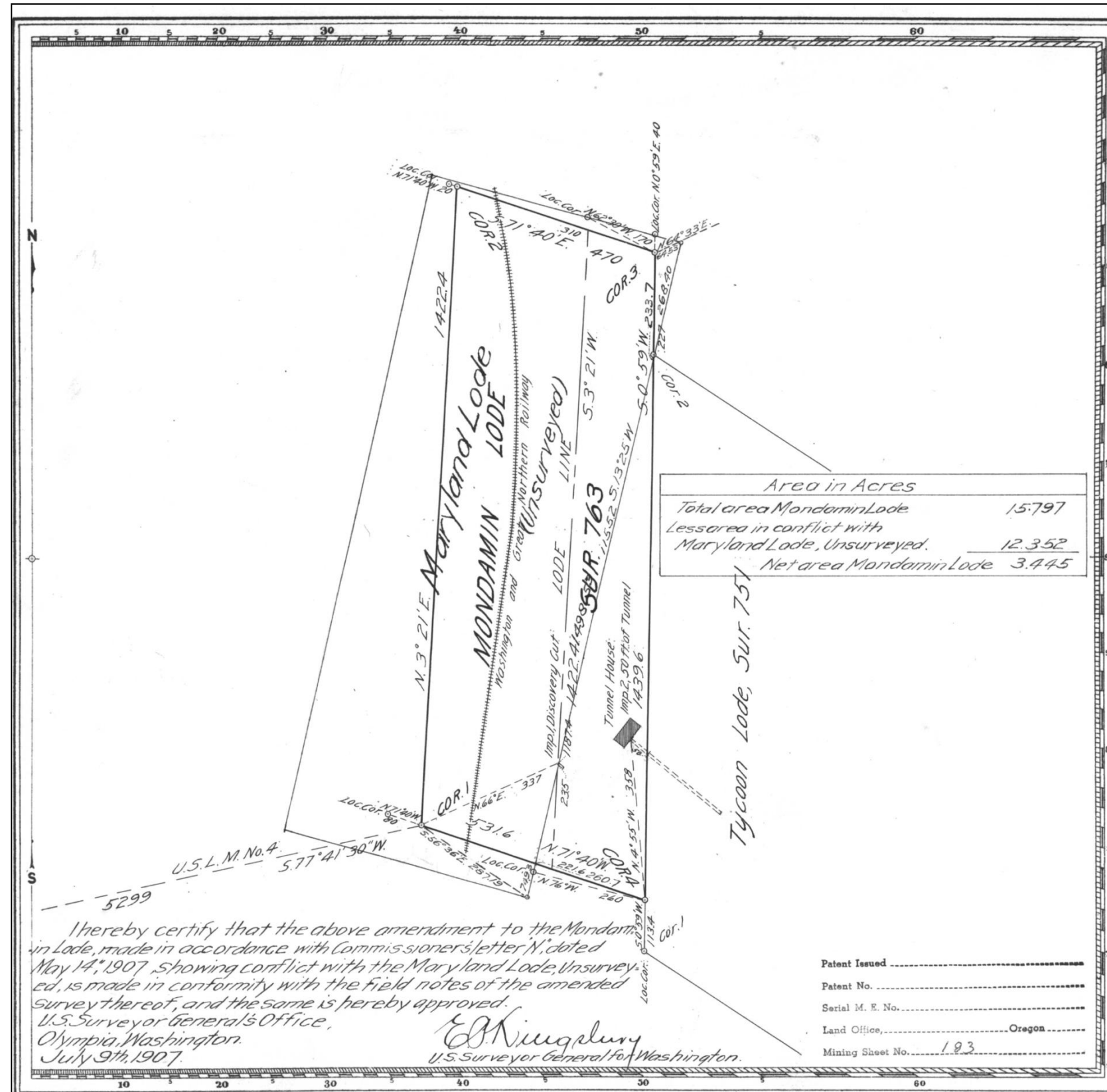
Surveys Designated	By Whom Surveyed	Contract		Amount of Surveys			When Surveyed	
		No.	Date	Ms.	Chs.	Lhs.	Begun	Completed
East Boundary	Geo. C. Campbell	583	March 24, 1902	5	43	90	Nov. 19, 1902	March 30, 1906.
Subdivisions	"	"	"	52	65	92	"	"
Meanders	"	"	"	14	52	52	"	"
Connections	"	"	"	2	75	63	"	"
Retrace Ind. Allot's.	"	"	"	5	44	50	"	"
" Int. Bdy.	"	"	"	5	19	79	"	"
South Boundary	"	"	"				Sept. 12, 1902	Sept. 15, 1902
West	"	"	"				July 29, "	July 30, "



Lone Ranch Survey – Maryland Lode, Unsurveyed and Unpatented

Section 16, T40N, R34E, Willamette Meridian

In 1907 the Mondamin Lode, Survey 763, was reduced in area to account for a prior claim, the unsurveyed Maryland Lode. Two corners of the Maryland Lode were tied to the resurvey of the Mondamin Lode, which was reduced in size from 15.797 acres to 3.445 acres.



T40N R34E Sec 16

Claim Located August 3, 1903

Mineral Survey No. 763

Lot No. _____ Land District.

PLAT
OF THE CLAIM OF

Minnehaha Copper Gold Mining Company
KNOWN AS THE

Mondamin Lode
In the ceded portion of the Colville Ind. Res.
IN CURLEW MINING DISTRICT,
FERRY COUNTY, WASHINGTON

Containing an Area of 15.797 Acres.
(Original Certificate Maryland Lode 12.352 Ac. Net area 3.445 Ac.)
Scale of 200 Feet to the inch.
Variation 22°30'24"30"E.

SURVEYED May 19, 1904 BY
Arthur A. Booth U.S. Deputy Mineral Surveyor

The Original Field Notes of the Survey of the Mining Claim of
Minnehaha Copper Gold Mining Company
known as the Mondamin Lode

from which this plat has been made under my direction, have been examined and approved, and are on file in this office, and I hereby certify that they furnish such an accurate description of said Mining Claim as will, if incorporated into a patent, serve fully to identify the premises, and that such reference is made therein to natural objects or permanent monuments as will perpetuate and fix the locus thereof.

I further certify that Five Hundred Dollars worth of labor has been expended or improvements made upon said Mining Claim by claimant or its grantors, and that said improvements consist of

Imp. 1, Discovery Cut 4'10"16 ----- \$100.
Imp. 2, First 50 ft. of Tunnel 5'7"260 ----- 500.
Total value of improvements ----- \$600.

that the location of said improvements is correctly shown upon this plat, and that no portion of said labor or improvements has been included in the estimate of expenditures upon any other claim.

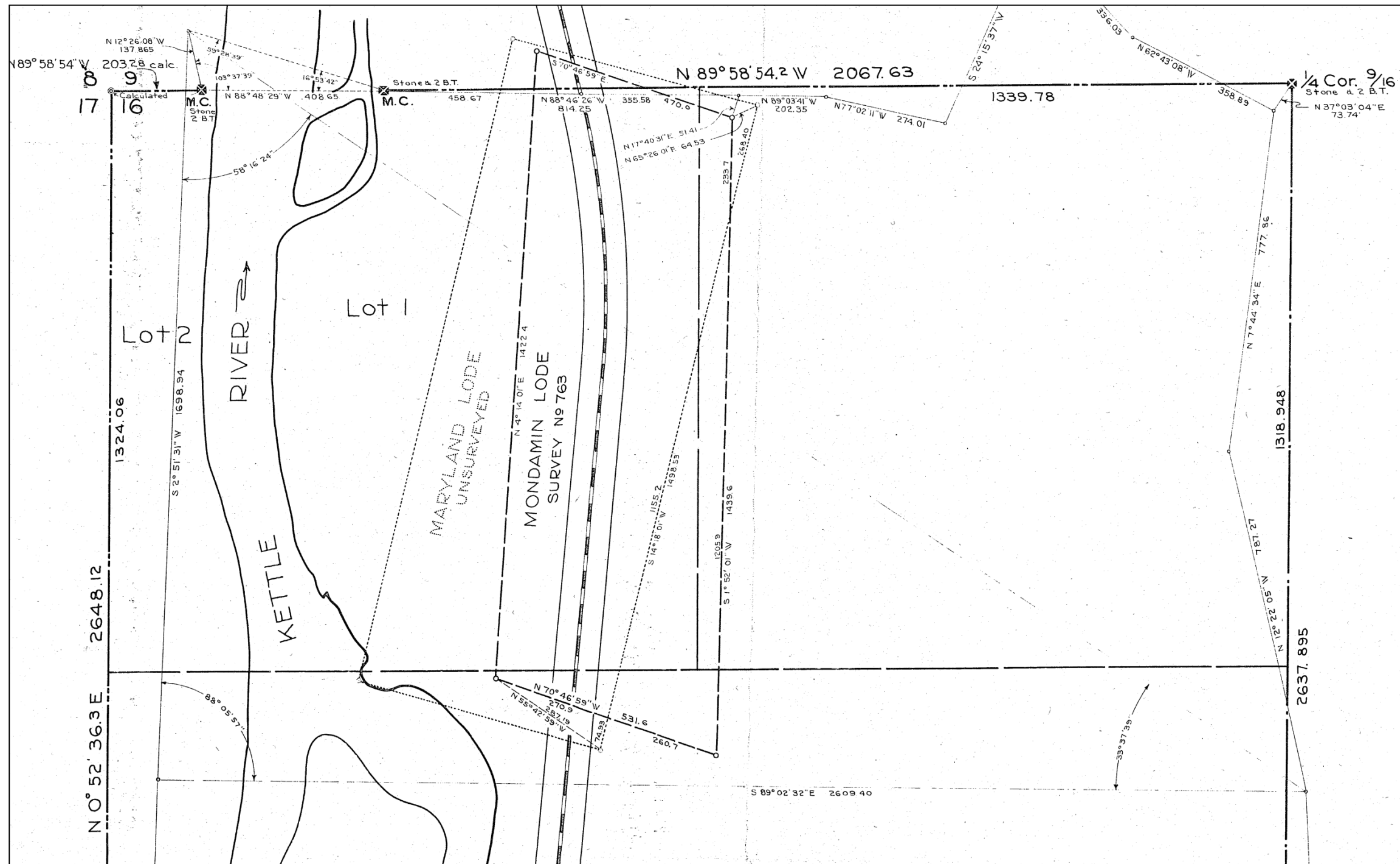
And I further certify that this is a correct plat of said Mining Claim made in conformity with said original field notes of the survey thereof, and the same is hereby approved.

U.S. Surveyor General's Office. *E. Kingbury*
Olympia, Washington. U.S. Surveyor General for
June 29, 1904 Washington.

Patent Issued _____
Patent No. _____
Serial M. E. No. _____
Land Office, _____ Oregon _____
Mining Sheet No. 193

Section 16, T40N, R34E, Willamette Meridian

In 1940 the Department of Public Lands surveyed the northwest quarter of Section 16 to determine the location of Lot 1 to which the State had a right to patent. The Morning Star Mining Company was interested in purchasing Lot 1 and provided a tie between the State field traverse and the original northeast corner of the Mondamin Lode and a bearing along the original east line of the lode. From that information the State survey plat calculated the location of the Mondamin and Maryland Lodes based on the angles and distances on the mineral survey. The State deeded Lot 1 to Morning Star Mining in 1950.

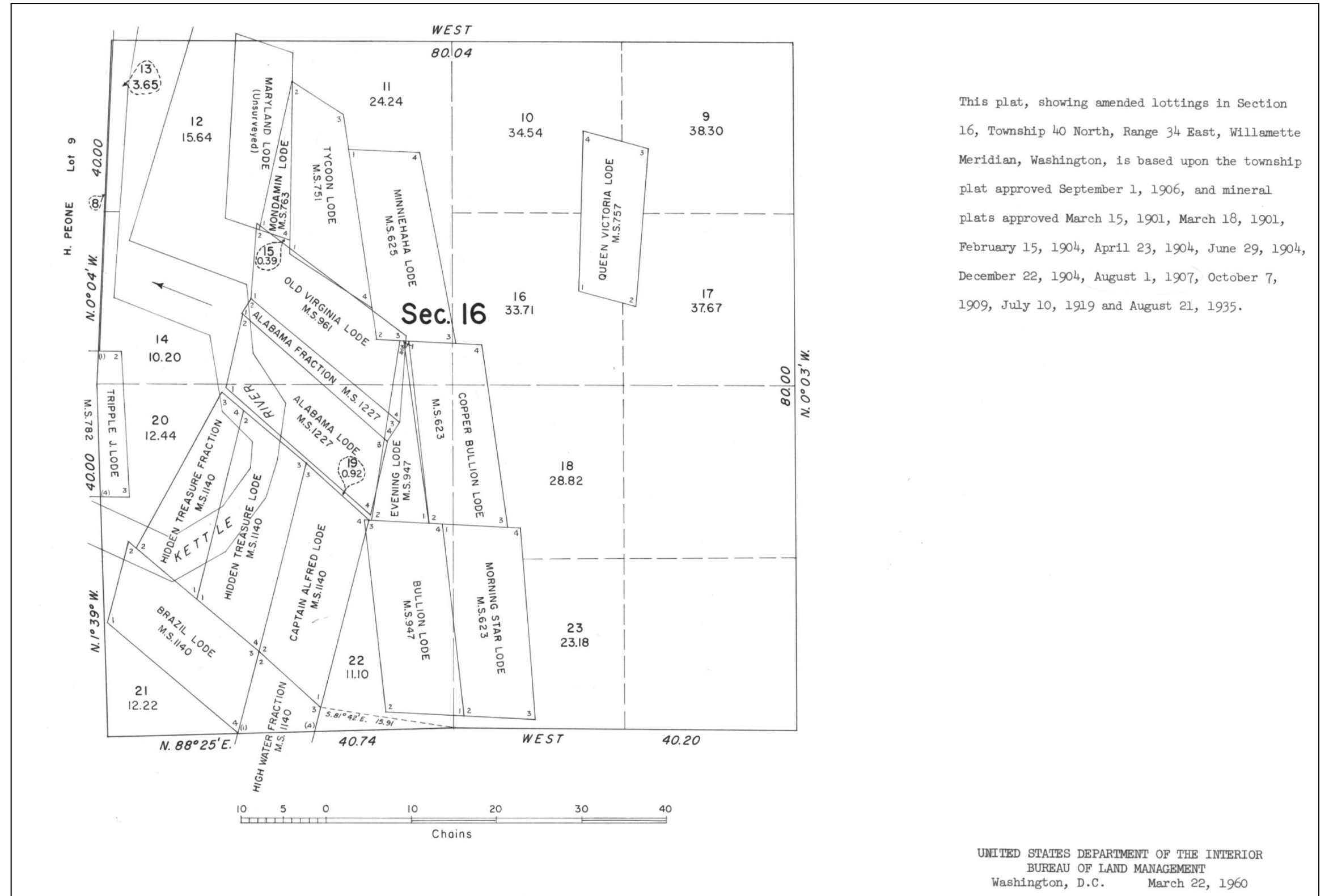


Lone Ranch Survey – Maryland Lode, Unsurveyed and Unpatented

Section 16, T40N, R34E, Willamette Meridian

The BLM issued a supplemental plat in 1960 to show all the mineral claims and patents. In 1973 the BLM issued a patent to the State of Washington for "Section 16, Lots 9 to 23, inclusive, and E1/2SE1/4." The State deed of Lot 1 to a mining company in 1950 creates a problem. The southerly part of Lot 12 was a part of Lot 4, which never went to patent. The State sale of Lot 1 would not include that area. Does the state still own that part of Lot 12 that is in the S1/2 of the NW1/4?

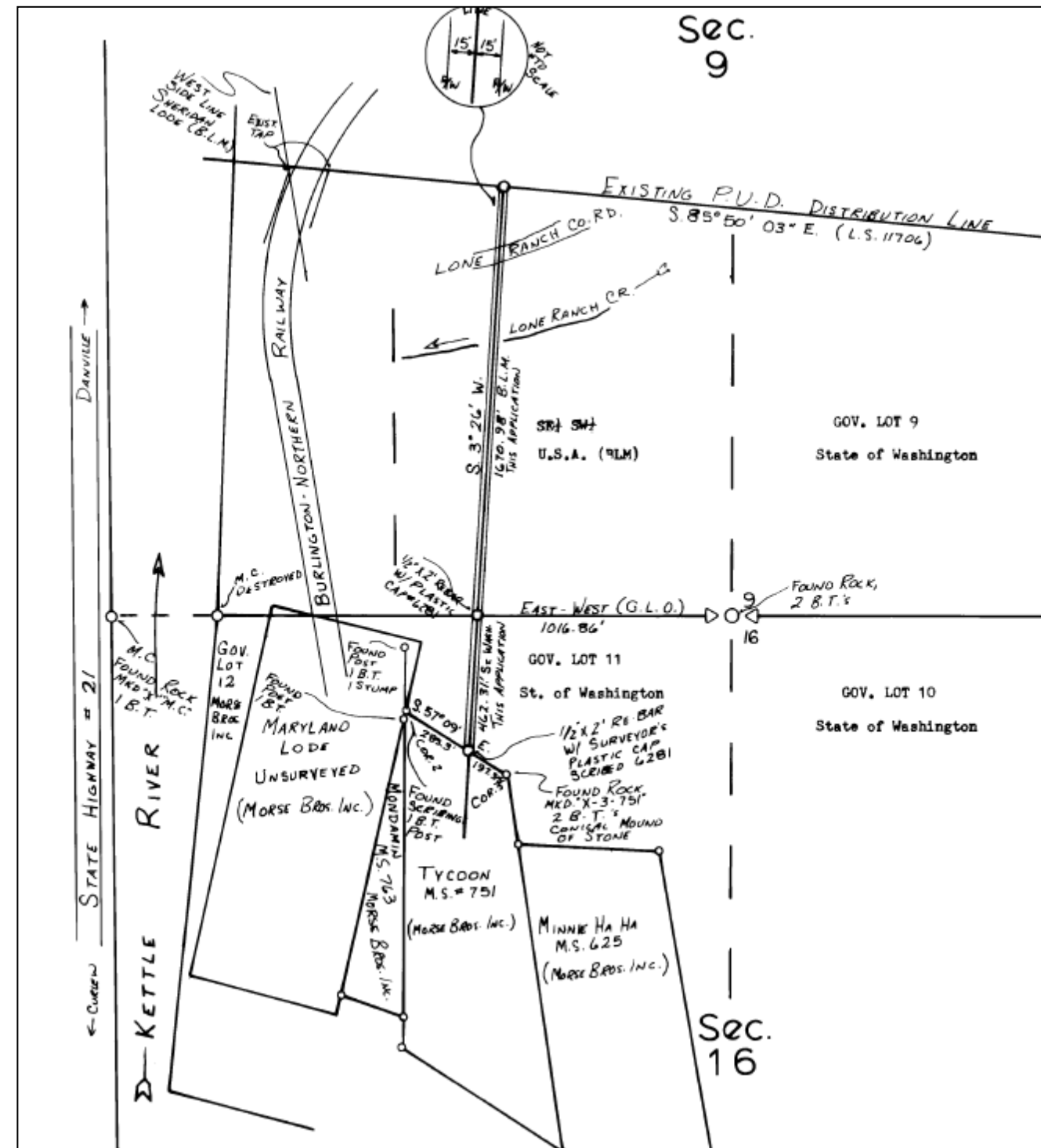
Notice that the supplemental plat uses the old boundaries of the Mondamin Lode to portray the boundaries of the unsurveyed Maryland Lode. That raises a question as to the boundaries of Lots 11 and 12. Presumably the actual boundaries of the unsurveyed Maryland Lode would be the boundary instead of the boundaries portrayed on the supplemental plat.



Lone Ranch Survey – Maryland Lode, Unsurveyed and Unpatented

Section 16, T40N, R34E, Willamette Meridian

A 1980 power line right of way plat over State land shows the unsurveyed Maryland Lode to be configured per the revision of Mineral Survey 763, the Mondamin Lode, not configured as shown on the supplemental BLM plat.



Lone Ranch Survey – Maryland Lode, Unsurveyed and Unpatented

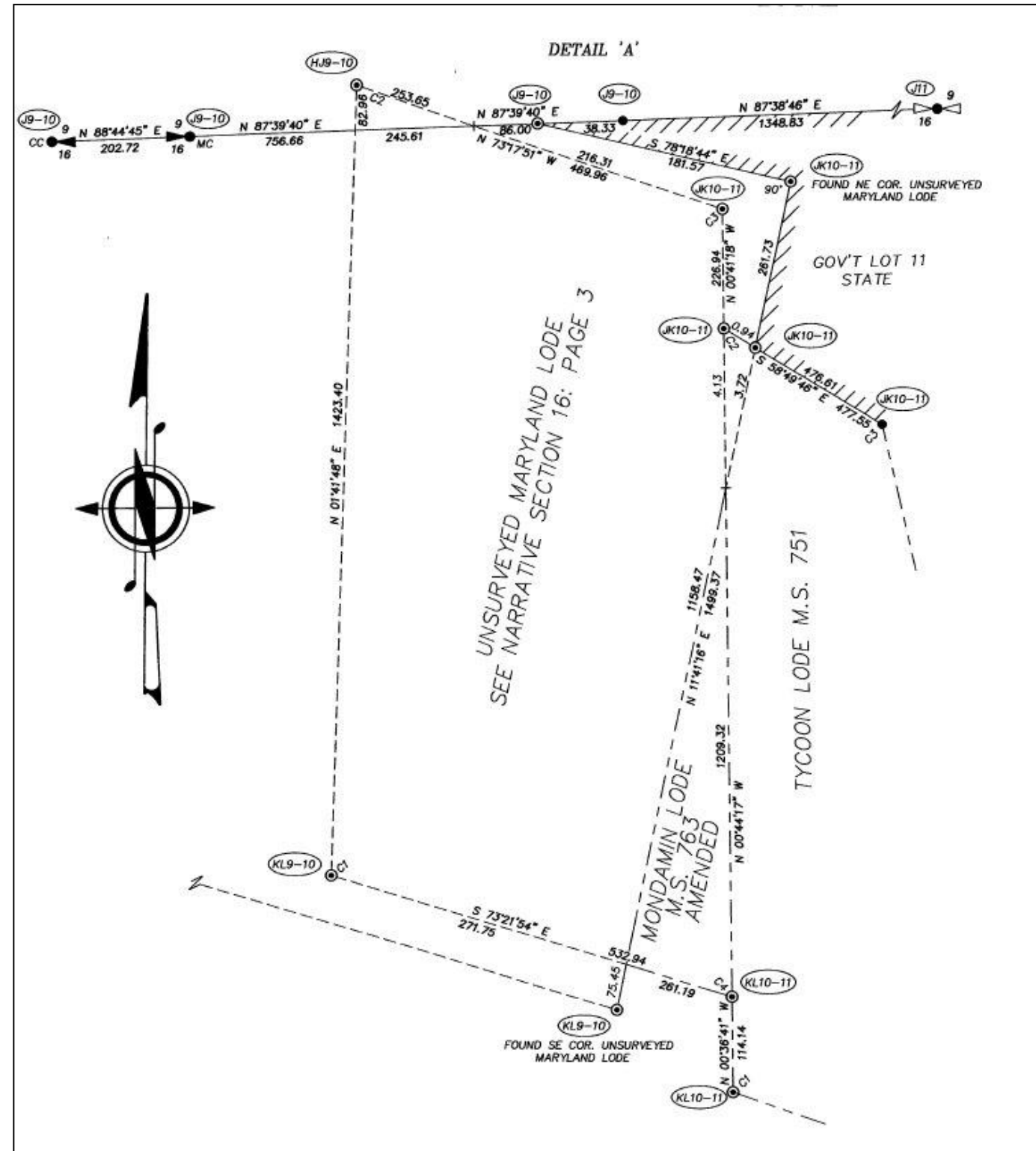
Section 16, T40N, R34E, Willamette Meridian

The May 2005 DNR survey used the boundaries of the unsurveyed Maryland Lode to define the location of Lot 11, respecting the location as shown on the mineral survey, not as shown on the 1960 supplemental plat.

The 2005 survey did not address the question of whether the State owns part of Lot 12.

SECTION 16:

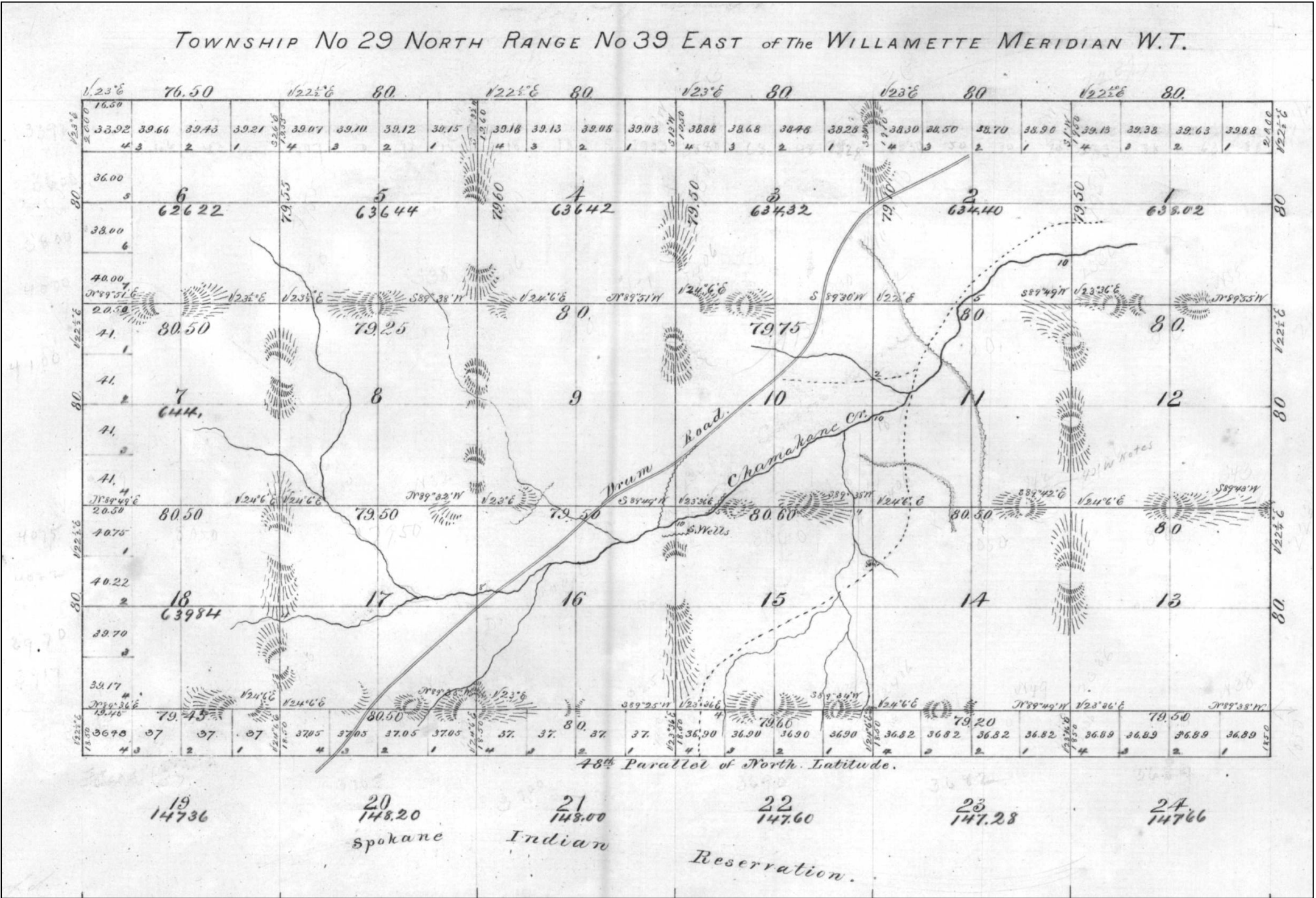
IN DETERMINING THE WESTERLY LINE OF GOVERNMENT LOT 11, IT IS APPARENT THAT THE 1960 BLM SUPPLEMENTAL PLAT OF SECTION 16, IS IN CONFLICT WITH THE APPROVED JUNE 29, 1904 AND AMENDED JULY 9, 1907 PLAT OF THE MONDAMIN LODGE, MINERAL SURVEY NO. 763 WHICH HAS TIES TO THE NORTHEAST AND SOUTHEAST CORNERS OF THE UNSURVEYED MARYLAND LODGE. THE EASTERLY AND NORTHERLY LINES OF THE UNSURVEYED MARYLAND LODGE ONCE THEY CROSS THE LINE BETWEEN CORNER 4 AND CORNER 1, OF THE MONDAMIN LODGE, MINERAL SURVEY NO. 763 AND THE LINE BETWEEN CORNERS 2 AND 3 OF TYCOON LODGE MINERAL SURVEY NO. 751 ARE IN COMMON WITH THE MOST WESTERLY LINE OF GOVERNMENT LOT 11. THE ORIGINAL SURVEY OF MINERAL SURVEY NO. 763 FOUND AND TIED THE NORTHEAST AND SOUTHEAST CORNERS OF UNSURVEYED MARYLAND LODGE. THIS SURVEY FOUND ALL FOUR CORNERS OF THE MONDAMIN LODGE, MINERAL SURVEY NO. 763 AND THE NORTHEAST AND SOUTHEAST CORNERS OF THE UNSURVEYED MARYLAND LODGE. THE LINE RUNNING NORTHWESTERLY FROM THE FOUND NORTHEAST CORNER OF UNSURVEYED MARYLAND LODGE WAS MADE AS A RIGHT ANGLE TO THE LINE FROM THE FOUND SOUTHEAST TO NORTHEAST CORNERS OF THE UNSURVEYED MARYLAND LODGE. THIS LINE WAS EXTENDED NORTHWESTERLY TO ITS INTERSECTION WITH THE LINE BETWEEN SECTION'S 9 AND 16.



Empey Survey – Benson Syndicate Retracement
Sections 2 – 24, T29N, R39E, Willamette Meridian

In 1883 Wencel H. Placy retraced part of the external boundaries and subdivided the portion of T29N, R39E, lying north of the Spokane Indian Reservation. The GLO surveys in Stevens County performed under contracts to Wencel Plachy and David Thayer were part of the Benson Syndicate fraud upon the General Land Office. Some of the lines were run and some of the corners were set; most were not.

Surveys Designated	By Whom Surveyed	Contract		Amount of Surveys.			When Commenced	When Completed
		No	Date	Miles	Chains	Links		
Subdivisions	Wencel H. Placy.	299	6 th June 1883	34	8	70	7 th July 1883	31 st Aug. 1883
Retracing N & S boundaries				.9	15	00		
Total N. Acres	12075.66							



Empey Survey – Benson Syndicate Retracement

Sections 2 – 24, T29N, R39E, Willamette Meridian

The following was written by the DNR surveyor in 1993.

T29N, R39E, north of the Spokane Indian Reservation, was surveyed by U.S. Deputy Surveyor, Wencel H. Plachy, in 1883 under contract No. 293. Wencel H. Plachy, the GLO surveyor, was part of the Benson Syndicate and did not set many of the corners he reported set. A comparison of the topographic calls in Plachy's field notes with the USGS 7.5 minute quadrangle map confirms that the Plachy survey was largely fictitious.

In the October 1972 edition of the Pacific Northwest Quarterly, Fred Yonce, in an article entitled "The Public Land Surveys in Washington," on page 138, identifies Wencel H. Plachy and David C. Thayer as deputy surveyors who made fraudulent special deposit surveys in Washington. On page 139, Yonce goes on to say that "twenty-two townships surveyed by Plachy and Thayer in northeastern Washington were suspended and withdrawn from entry for gross irregularities, but the action was revoked in 1890 upon complaints by settlers and the state legislature that delays and resurveys would only aggravate complications."

Evidently both the settlers and the state legislature expected the unknown corners in the Plachy and Thayer townships to be established in some manner other than by a GLO survey. There are two methods for such unknown corners to be established: (1) the dependent methods of proportionment as outlined in Chapter 5 of the 1973 BLM Manual of Surveying Instructions, and (2) the acquisition of bona fide rights by the location of corners in good faith as outlined in Chapter 6 of the same manual.

Presuming that the settlers in this township had very few original GLO corners to work with, it can be expected that corners located in good faith from existing corners will not have been established using normal methods of double and single proportionment, but will have been established from whatever existing corner was available. Thus, one can expect to find valid corners established in good faith using many methods, three-point, two-point, and even one-point control. We can expect corners located in good faith by surveyors landowners, often in steep terrain, to be tens of feet out of intended position. This township is considerably smaller than the GLO record in both north-south and east-west directions. North-south the GLO record is about 258 chains, or 17,028 feet. On average the township measures about 16,200 feet, or about 800 feet short of record. East-west the record averages very close to 6 miles, or 31,680 feet.

The actual east-west measurement averages about 30,700 feet, or 1,000 feet short. Thus, one can expect to find many measurements that differ greatly from the GLO record.

Considering that the legislature and settlers intentionally did not allow for a formal survey to settle the corner problems in Plachy and Thayer townships, one must give much weight to any and every indication of good faith location of corners. It now being (in 1993) over 100 years since the settlers in this township were left to fend for themselves with regard to corners, we cannot expect to be able to readily find testimony as to the personnel, methods and intent of long deceased landowners in their locating of corners not originally set by the GLO surveyor. We must make heavy use of the comparison of "fencing, culture, or other improvements" (Section 6-16) with positions calculated by all combinations of double proportionment, three-point, two-point, and one-point control. Such comparisons can provide us with evidence of previous good faith locations of corners.

What standards should be used in the comparison of possible good faith locations of corners with calculated positions? Section 6-16 of the Manual is pertinent to this. It says that "lack of good faith is not necessarily chargeable if the entryman has not located himself according to a rigid application of the rules laid down for the restoration of lost corners where ... (2) there are no existing corners in one or more directions for an excessive distance; (3) existing marks are improperly related to an extraordinary degree." Both conditions apply to this township.

In cases where some legal process, perhaps adverse possession, has made a property corner at some location different from a GLO corner that would otherwise be the property corner, we have often talked about the distinction between the "property corner" and the "true GLO corner." It is important not to carry that distinction over to the discussion of bona fide rights and corners located in good faith. Section 6-28 of the BLM Manual cautions us about accepting local corners where it says that "once it is accepted, a local point of control has all the authority and significance of an identified original corner. The surveyor must therefore use extreme caution in adopting local points of control. These may range from authentic perpetuation of original corners down to marks which were never intended to be more than approximations." It may be very difficult to differentiate locations intended to be merely approximations from good faith locations of missing corners. The distinction

between the two may blur to the point that an approximate location of a missing GLO corner has been relied on to the degree that it cannot be distinguished from a good faith location. The same section of the Manual goes on to say that "the age and degree to which a local corner has been relied on by all effected landowners may lead to its adoption as the best remaining evidence of the position of the original corners." It seems that the Manual would give us some liberty in determining whether a local corner is a true corner, whether because it is an acceptable good faith location, or simply because it is just the best thing we have to use.

A BLM document cites a court case, RG17 Robert C. Harlow Jr., No. C-83-AAM (1988), which discusses the evaluation of potential good faith locations. It says, "An entryman establishes bona fide rights within the meaning of the 1909 Resurvey Act if he locates his claim in good faith by reference to at least one corner of the government survey under which the land was patented." This contradicts the Manual Section 6-27 which would restrict the acceptance of corners established by one-point control.

Two methods for accepting corner monuments in a fraudulent survey area are (1) to determine the corner monument is a good faith location by showing a good mathematical relationship to adjoining corners and (2) to determine the corner monument is the best evidence of the original location because of its age and the degree of local reliance on its position.

It is known from experience in other townships surveyed by Plachy that he usually did survey township exteriors and that he did set some corners in township interiors. One can expect to find corner monuments for which it cannot be determined whether they are perpetuations of an original corner with lost or fictitious bearing trees, or whether they are corners set by others in good faith after the GLO survey.

The 1974 edition of the BLM pamphlet on the Restoration of Lost or Obliterated Corners and Subdivision of Sections, page 10, says that "if there is some acceptable evidence of the original location of the corner, that position will be employed." This survey makes heavy use of this concept in its acceptance of corner monuments which cannot be proven not to be at the corner location.

Empey Survey – Benson Syndicate Retracement

Sections 2 – 24, T29N, R39E, Willamette Meridian

LANDOWNER AND TIMBER COMPANY INFORMATION

Louis D. Hunt, who cruised for Potlatch Lumber, Deer Park Pine and subsequently for Boise Cascade, did a lot of work in the township, apparently in the 1950's. Deer Park Pine was bought out by Boise Cascade. Boise Cascade records for the township are sketchy and often useless. Mainly they refer to the fact that someone saw a fence corner, or some such thing, with no supporting data. Louis Hunt's personal records do not reveal whether he found or set a corner. He cannot remember what he did in the township. He may have set some of the corners of unknown origin.

There are very few old landowners left. Arthur Miller, aged 90, raised in Section 8 and 17, is now (1993) living in Deer Park and has a good memory. Lawrence Morrell in Section 11, in his 80's, knows nothing about corners. Ernest Gehke in Sections 1 and 2, moved into the township in 1939. John Jacobs, son of an old landowner in Section 2, knows nothing about corners. Larry Hasse, son of an old landowner, now a physician in Alabama, of no use for corner info. Everyone else is of recent vintage.

The lack of known corners seems to have created a know-nothing attitude on the part of the older landowners in the area. They have an idea where their property is but they don't know much about how it is that it is where it is. Many of them do understand that there is a lack of known corners. Most of the newer landowners do not know of the problems in the area.

PREVIOUS BOUNDARY SURVEYS (before 1993)

Very few professional surveyors have worked in this township.

Fred Poyner, PLS, did some preliminary work for a subdivision in 1973. Cascade Surveying's records from that time are valuable as to the conditions at that time at several of the GLO corners in the eastern part of the township.

Jon Svenningsen, PLS, filed one survey in sections 9 and 16.

Dick Bard, PLS, filed an LCR for the corner of sections 7, 8, 17, and 18, filed a survey in section 6 and another in section 10.

Gerald Masgai, PLS, filed two surveys in sections 9 and 16.

SURVEYS AFTER THE DNR SURVEY IN 1993

One survey disagrees with DNR concerning the 1/4 corner of sections 15 and 22.

Sara Marks, PLS, section 15 in 1995

John M. Shackelford, section 13 in 1995

Richard Bard, PLS, section 17 in 1998

Richard Bard, PLS, section 10 in 1999

Richard Bard, PLS, section 3 in 1999

Richard Bard, PLS, section 10 in 2000

Jasper M. Sams, PLS section 15 in 2000

The Sams survey disagrees with DNR survey.

Lawrence E. Benson, PLS, sections 9 and 16 in 2001

Rudy F. Kitzan, PLS, section 1 in 2002

James W. Stillinger, PLS, section 1 in 2002

John M. Shackelford, section 17 in 2002

James W. Stillinger, PLS, section 1 in 2003

Lawrence E. Benson, PLS, section 2 in 2005

Rudy F. Kitzan, PLS, section 9 in 2006

James W. Stillinger, PLS, sections 7, 8, and 17 in 2006

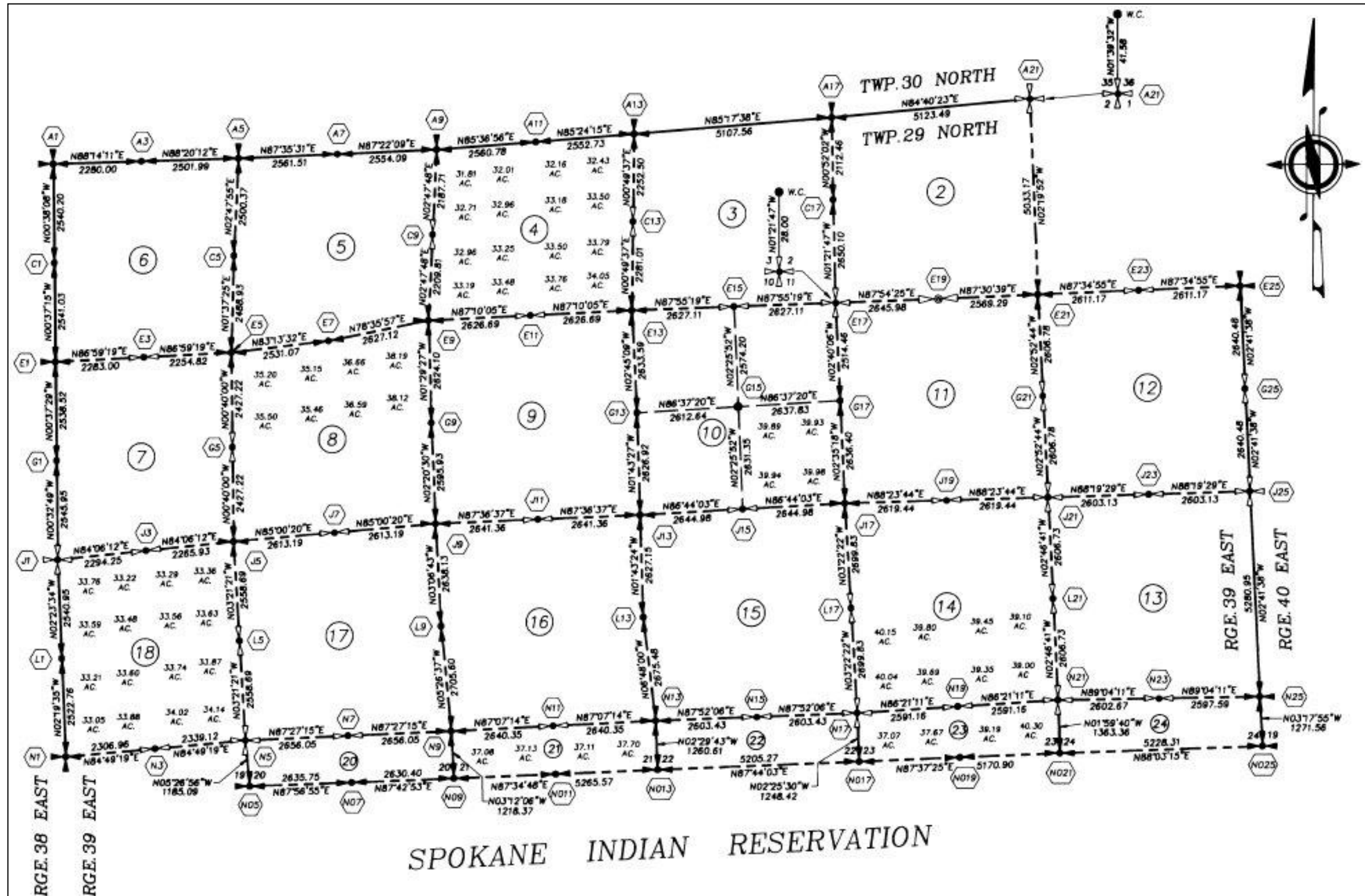
James W. Stillinger, PLS, section 7 in 2007

James W. Stillinger, PLS, sections 7, 8, and 17 in 2008

Empey Survey – Benson Syndicate Retracement

Sections 2 – 24, T29N, R39E, Willamette Meridian

The 1994 DNR survey shows that both the township exterior and many of the sections are of irregular size and shape. Only a few representative corners will be examined in the following pages.



Empey Survey – Benson Syndicate Retracement

Sections 2 – 24, T29N, R39E, Willamette Meridian

Corner of Sections 5, 6, 7, and 8

This is an example of how a corner monument, even though it may have been initially rejected, can age into being the best evidence of the corner location. This corner monument might represent the original corner location, or might represent a good faith location for a corner not originally set, or might be an arbitrary location.

E5 NORTHEAST CORNER SECTION 7.

FOUND AND ACCEPTED MONUMENT.

IN 1883 GLO SURVEYOR, WENCEL H. PLACHY REPORTED THAT HE SET A POST WITH 4 BEARING TREES.

A 1927 MAP OF SPRINGDALE-HUNTER PERMANENT HIGHWAY NO. 2-D BY T.M. OFFUTT, ENGINEER OF STEVENS COUNTY, ON FILE WITH THE DNR, SHOWS THAT NO EVIDENCE OF THE CORNER WAS FOUND. THE MAP ALSO SHOWS THAT THE CORNER AS SET BY PHOENIX LUMBER COMPANY WAS NOT ACCEPTED AS BEING THE CORNER LOCATION.

A 1927 COUNTY ENGINEERS PLAN OF SPRINGDALE-HUNTERS PERMANENT HIGHWAY NO. 2-D SHOWS THAT THE CORNER WAS NOT FOUND.

ON 10/20/61, PER COUNTY FIELD BOOK 378, PG 15, A COUNTY CREW FOUND A SQUARED STAKE AT A FENCE CORNER. THE COUNTY NOTES THAT IT IS SUPPOSED THAT THE CORNER WAS SET BY SOME LOGGING COMPANY AND THAT THERE IS NO GLO EVIDENCE.

IN 1962 DNR EMPLOYEE, RYDER CHRONIC, FOUND A WOOD STAKE AT A FENCE CORNER AND SET A DNR TAG.

A 1963 RIGHT OF WAY PLAT FOR SPRINGDALE-HUNTERS ROAD, REVISION NO. 1, NO.2709, BY PAUL W. HERITAGE, LICENSED ENGINEER, ON FILE WITH THE DNR, SHOWS A LOCAL CORNER AT A FENCE INTERSECTION AND A CALCULATED CORNER IN A DIFFERENT LOCATION.

A 1963 PLAN FOR SPRINGDALE-HUNTERS ROAD, C.R.P. 323, SHOWS A LOCAL CORNER AT A FENCE INTERSECTION AND A CALCULATED CORNER IN A DIFFERENT LOCATION.

A 1965 RIGHT OF WAY PLAT FOR PACIFIC NORTHWEST BELL BY PHILIP L. SARGENT, PLS 4413, ON FILE WITH THE DNR, SHOWS THE CORNER TO BE A BRASS CAP ON AN IRON PIPE REPLACING A FOUND 4" X 4" POST AT A FENCE CORNER.

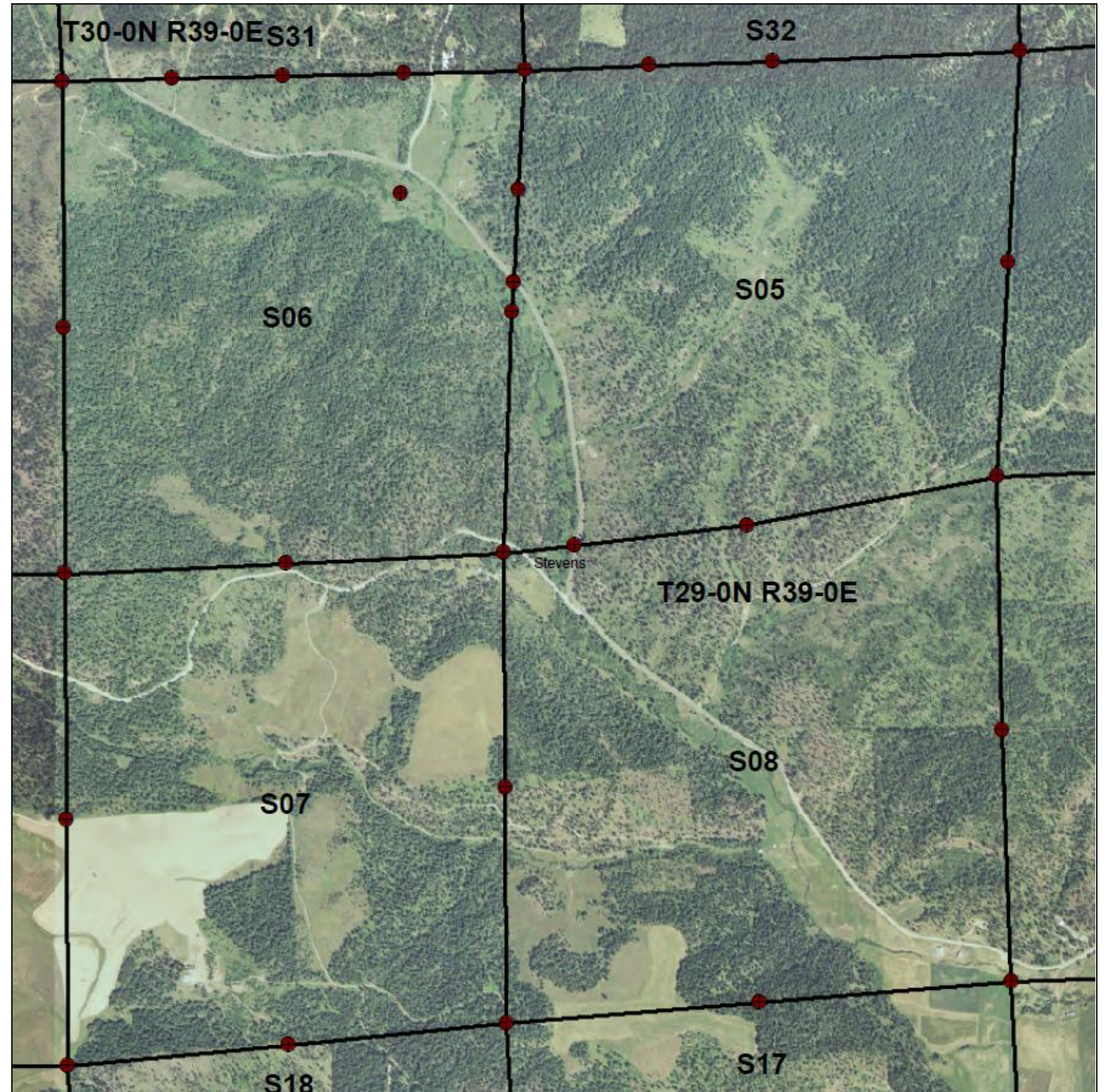
COUNTY FIELD BOOK 387, PG 64 (UNDATED), SHOWS THAT THE COUNTY FOUND A STAKE IN A FENCE. A MAP IN COUNTY ROAD FILE #2917 SHOWS THE CORNER TO BE A LOCAL CORNER.

A 1982 RIGHT OF WAY PLAT FOR WASHINGTON WATER POWER COMPANY BY LAURENCE A. HALL, PLS 9826, FOUND AND ACCEPTED THE SARGENT BRASS CAP ON 3/4" IRON PIPE.

IN 1986, PER COUNTY FIELD BOOK 419, PG 22, COUNTY FOUND A 3/4" PIPE WITH BRASS CAP 9' SOUTHWEST OF A 3-WAY FENCE CORNER.

A 1987 - PLAN FOR SPRINGDALE-HUNTERS ROAD, C.R.P. 628, SHEET 5 OF 7, SHOWS THE CORNER TO BE A FOUND 3/4" IRON PIPE WITH BRASS CAP. THE SAME INFORMATION IS SHOWN ON A RIGHT OF WAY PLAN OF A PORTION OF C.R.P. 628 ON FILE WITH THE DNR.

THIS SURVEY FOUND THE 2" BRASS CAP ON 1" IRON PIPE SET BY SARGENT. THE BRASS CAP FALLS 3 FEET NORTHWEST OF THE CENTER OF A SMALL STREAM AND N23W, 8.5 FEET FROM A FENCE INTERSECTION RUNNING SOUTH, WEST AND NORTHEAST. THE POSITION MAY HAVE ORIGINALLY BEEN SET BY A PHOENIX LUMBER COMPANY SURVEYOR IN ORDER TO MONUMENT A POSITION NOT MONUMENTED BY THE GLO SURVEY, OR THE PHOENIX LUMBER COMPANY SURVEYOR MAY HAVE PERPETUATED THE GLO POSITION. THE POSITION IS CLEARLY RELIED UPON BY OCCUPATION LINES GOING ONE MILE TO THE SOUTH AND IS SUPPORTED BY THE 1/4 CORNER BETWEEN SECTION 5 AND 6. THIS SURVEY ACCEPTS THE SARGENT BRASS CAP AS THE BEST EVIDENCE OF THE CORNER.



Empey Survey – Benson Syndicate Retracement

Sections 2 – 24, T29N, R39E, Willamette Meridian

Refer to the map on the previous page for these two corners. The northeast corner of section 18 is presumed to be either an original position or a good faith location based on single point control. The northeast corner of section 17 is accepted as an original corner, one the few corners inside the township that has a traceable pedigree.

J5 NORTHEAST CORNER SECTION 18.

FOUND AND ACCEPTED CORNER.

IN 1883 GLO SURVEYOR, WENCEL H. PLACHY, REPORTED THAT HE SET A STONE WITH A MOUND OF STONES ALONGSIDE AND WITH NO BEARING TREES.

IN 1956 L. HUNT AND M. CHAMBERS, ACCORDING TO BOISE CASCADE INFORMATION, FOUND A STAKE AND POST.

A 1965 RIGHT OF WAY PLAT FOR PACIFIC NORTHWEST BELL BY PHILIP L. SARGENT, PLS 4413, ON FILE WITH THE DNR, SHOWS THAT HE FOUND AN OLD 4" X 4" POST IN A ROCK MOUND AND SET A 3/4" PIPE ALONGSIDE.

IN 1992 RICHARD BARD, JR., PLS 16898, PER LCR FILED IN BOOK 16, PAGE 19, OF LAND CORNERS, FOUND THE POST, WITH THE SARGENT PIPE ALONGSIDE, AND PERPETUATED THE POST WITH AN ALUMINUM MONUMENT STAMPED "T29N R39E 1992 LS 16898". A POTLATCH TAG, DATED 1956, WAS FOUND. SOME DNR TAGS WERE FOUND. BARD CLAIMS THAT IT IS CLEARLY A LOCALLY ACCEPTED POSITION FOR THE SECTION CORNER, BUT NEITHER ACCEPTS NOR REJECTS THE POSITION PENDING FURTHER INVESTIGATION.

THIS SURVEY FOUND THE BARD MONUMENT. DEVELOPED LAND TO THE NORTHEAST OF THE MONUMENT HAS OBVIOUSLY RELIED UPON THE CORNER LOCATION. IT FITS REASONABLY WELL WITH AN ACCEPTED SECTION CORNER TO THE EAST FOR DISTANCE, 5226 FEET AGAINST A GLO RECORD OF 79.50 CHAINS OR 5247 FEET. IT DOES NOT FIT THE GLO RECORD IN ANY OTHER DIRECTION, ALL DISTANCES BEING SHORT OF RECORD. A DOUBLE PROPORTIONED POSITION USING THE NORTHWEST CORNER OF SECTION 18, THE NORTHEAST CORNER OF SECTION 7, THE NORTHEAST CORNER OF SECTION 17 AND THE CORNER BETWEEN SECTIONS 19, 20 AND THE SPOKANE INDIAN RESERVATION FOR CONTROL WOULD RESULT IN A POSITION S70-27-41E, 393.22 FEET FROM THE BARD MONUMENT AND WOULD GREATLY DISTORT THE NORTH-SOUTH SECTION LINE BEARINGS. THIS SURVEY CONCLUDES THAT EITHER THIS POSITION PERPETUATES A GLO POSITION, OR PERPETUATES A LOCAL CORNER ESTABLISHED IN GOOD FAITH USING THE CORNER COMMON TO SECTIONS 8, 9, 16 AND 17 AS A SINGLE-POINT CONTROL. IF IT IS THE ORIGINAL CORNER, THEN IT IS ACCEPTED. IF IT IS A LOCAL CORNER, IT IS ACCEPTED USING THE EXCLUSION IN SECTION 6-16 OF THE 1973 BLM MANUAL OF SURVEYING INSTRUCTIONS REGARDING SITUATIONS IN WHICH "EXISTING MARKS ARE IMPROPERLY RELATED TO AN EXTRAORDINARY DEGREE."

J9 NORTHEAST CORNER SECTION 17.

FOUND CORNER AND SET NEW MONUMENT.

IN 1883 GLO SURVEYOR, WENCEL H. PLACHY, REPORTED THAT HE SET A POST WITH 2 BEARING TREES:

26" PINE, N63E, 86 LINKS.

24" FIR, N45W, 22 LINKS.

THE 1912 COUNTY SURVEY OF J.O. CLINE ROAD, PER COUNTY FIELD BOOK 51, PAGE 2, SHOWS THE CORNER TO BE 48 FEET SOUTH OF A CREEK AT STATION 1+88. A ROAD B.T., A 16" PINE, WAS ESTABLISHED FOR STATION 0+00 AT N22W, 19 FEET.

IN 1913 ARTHUR A. MILLER, A LONGTIME RESIDENT OF SECTIONS 8 AND 17 AND NOW A RESIDENT OF DEER PARK, THEN AGED 10, SAW SEVERAL LARGE STONES EMBEDDED IN THE GROUND, AND SAW A YELLOW PINE, ABOUT 3 FEET IN DIAMETER, WITH BLAZE AND SCRIBING, FACING THE CORNER IN THE NORTHWEST QUADRANT. HIS FATHER TOLD HIM THAT THE STONES AND SCRIBING ON THE PINE TREE WERE IN PLACE WHEN HE HOMESTEADED IN 1889. IN ADDITION, MR. MILLER COMMENTED THAT THIS CORNER WAS THE ONE WHICH EVERYBODY SEEMED TO USE TO SURVEY FROM, NOTABLY THE PHOENIX LUMBER COMPANY SURVEYORS.

A 1927 COUNTY ENGINEERS MAP OF SPRINGDALE-HUNTERS PERMANENT HIGHWAY NO. 2-D SHOWS THE CORNER TO BE A STONE WITH 2 BEARING TREES 224 FEET SOUTH OF THE CENTERLINE OF THE HIGHWAY.

THE 1964 COUNTY SURVEY NOTES FOR MILLER PIT FOUND A STONE WITH 2 NOTCHES ON WEST SIDE IN A MOUND OF STONES UNDER A NORTH-SOUTH FENCE. THEY PUT A 2" IRON AXLE ON THE SOUTH SIDE OF THE STONE.

THE 1965 RIGHT OF WAY PLAT FOR PACIFIC NORTHWEST BELL BY PHILIP L. SARGENT, PLS 4413, ON FILE WITH THE DNR, SHOWS THE CORNER TO BE A FOUND AXLE IN A ROCK MOUND.

IN 1980 GERALD MASGAI, PLS 15740, PER SURVEY RECORDED IN BOOK 3, PAGE 1, FOUND A SMALL MOUND OF STONES WITH A 3" SQUARE HOLE IN THE CENTER. THE POSITION AGREES WITH THE COUNTY ENGINEERS ROAD NOTES AND LIES UNDER A NORTH-SOUTH FENCE. HE SET A 1/2" REBAR IN THE CENTER OF THE MOUND.

IN 1985 JON D. SVENNUNGSSEN, PLS 11432, FOUND A 1/2" REBAR WITH PLASTIC CAP STAMPED "15740" PER SURVEY RECORDED IN BOOK 6 AT PAGE 46.

THE 1987 COUNTY PLAN FOR C.R.P. 628, SHEET 6 OF 7, AND COUNTY FIELD BOOK 419, PAGES 23 AND 24, SHOW THE CORNER AS A FOUND 1/2 INCH PIPE WITH PLASTIC CAP MARKED L.S. 15740.

THIS SURVEY FOUND THE MASGAI REBAR IN A MOUND OF STONES 45 FEET SOUTH OF THE TOP SOUTH BANK OF CHAMOKANE CREEK. THE GLO NOTES DO NOT MENTION A CREEK. ACCEPTED REBAR POSITION AS THE BEST EVIDENCE OF THE CORNER.

THIS SURVEY REPLACED THE MASGAI REBAR WITH A STANDARD DNR ALUMINUM MONUMENT 1 FOOT EAST OF A NORTH-SOUTH FENCE AND DROVE A FIBERGLASS WITNESS POST ALONGSIDE.

Empey Survey – Benson Syndicate Retracement

Sections 2 – 24, T29N, R39E, Willamette Meridian

See the map on page 5.

The corner monument of Sections 4, 5, 8, and 9 was of unknown origin. It fit record measurements in two directions and was accepted as a good faith effort to locate the corner in relation to existing corners. There was evidence of long term reliance on the corner position.

E9 NORTHEAST CORNER SECTION 8.

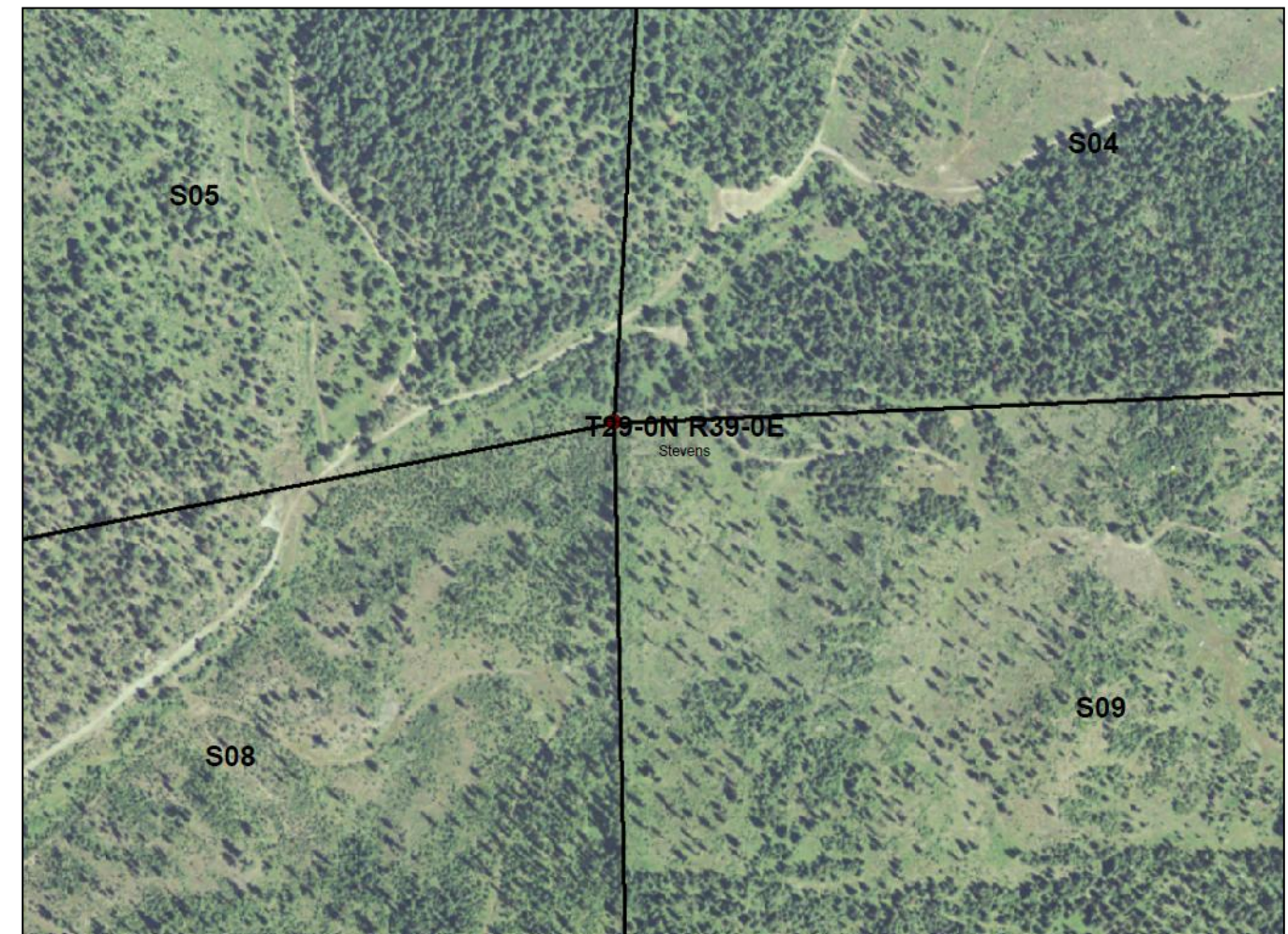
FOUND CORNER AND SET NEW MONUMENT.

IN 1883 GLO SURVEYOR, WENCEL H. PLACHY, REPORTED THAT HE SET A POST WITH THREE BEARING TREES.

IN 1985 JON D. SVENNUNGSSEN, PLS 11432, PER SURVEY RECORDED IN BOOK 6 OF SURVEYS AT PAGE 46, FOUND AND ACCEPTED A RAILROAD RAIL IN A SMALL ROCK MOUND UNDER A DETERIORATED FENCE RUNNING NORTH AND SOUTH.

THIS SURVEY FOUND THE RAILROAD RAIL, 3' LONG AND UP 18", IN A DOWNED NORTH-SOUTH FENCE IN THE NORTHEAST CORNER OF A CLEARCUT. RAILROAD RAILS HAVE BEEN FOUND MARKING OR WITNESSING SEVERAL CORNERS IN THE VICINITY, AMONG WHICH IS THE SECTION CORNER 1 MILE EAST. THE RAIL HAS A REASONABLE RELATIONSHIP WITH THE SECTION CORNER 1 MILE EAST (N87-10-05E 5253.38 FEET, GLO = S89-51E 80.0 CHAINS) AND WITH THE 1/4 CORNER 1/2 MILE SOUTH (S01-29-27E 2624.10, GLO = 40CHS). IT DOES NOT FIT WELL FOR DISTANCE TO CORNERS TO THE NORTH AND WEST. IN THAT THE CORNER FITS THE RECORD IN TWO DIRECTIONS IT IS DEEMED TO HAVE SATISFIED THE REQUIREMENT IN SECTION 6-17 OF THE 1973 BLM MANUAL THAT A CORNER LOCATED IN GOOD FAITH MUST BE RELATED IN SOME MANNER TO THE ORIGINAL SURVEY. A PROPORTIONED CORNER WOULD PUT AN OLD CLEARING WITH BUILDINGS IN SECTION 4 INSTEAD OF IN SECTION 9. THE POSITION OF RAILROAD RAIL IS ACCEPTED AS THE BEST EVIDENCE OF THE CORNER.

THIS SURVEY REPLACED THE RAILROAD RAIL WITH A STANDARD DNR ALUMINUM MONUMENT UP 3" IN A CIRCLE OF ROCKS. DROVE A FIBERGLASS WITNESS POST ALONGSIDE.



Empey Survey – Benson Syndicate Retracement

Sections 2 – 24, T29N, R39E, Willamette Meridian

The DNR survey accepts a corner restoration by a private surveyor for the corner of Sections 9, 10, 15, and 16. The restoration method was unorthodox.

J13 SOUTHEAST CORNER SECTION 9.

FOUND CORNER AND SET NEW MONUMENT

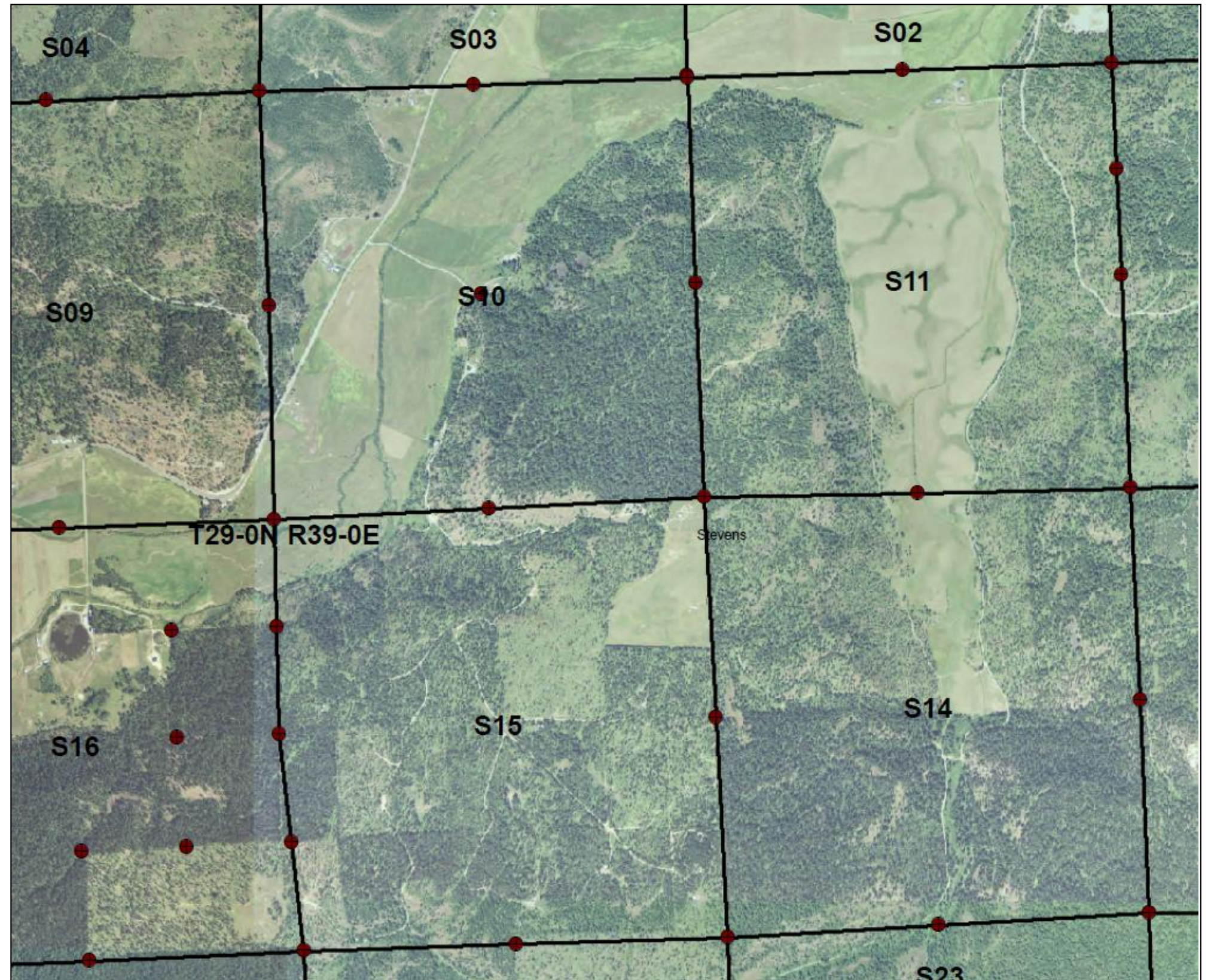
IN 1883 GLO SURVEYOR, WENCEL H. PLACHY, REPORTED THAT HE SET A POST WITH A MARKED STONE AND WITH NO BEARING TREES.

IN 1973, PER NOTES SUPPLIED BY FRED F. POYNER, P.E. 12716, A SURVEY CREW WORKING FOR CASCADE SURVEYING AND ENGINEERING FOUND A 1X2 STAKE BY AN OLD FENCE CORNER AND IDENTIFIED IT AS A POSSIBLE LOCATION OF THE SECTION CORNER.

IN 1985 JON D. SVENNUNGSSEN, PLS 11432, PER SURVEY RECORDED IN BOOK 6 OF SURVEYS, PAGE 46, SET A 1/2" REBAR WITH PLASTIC CAP BY SINGLE PROPORTIONMENT BETWEEN THE QUARTER CORNERS TO THE NORTH AND SOUTH. HE SAID THAT "DOUBLE PROPORTIONMENT WAS NOT USED BECAUSE NO GLO OR CORNER EVIDENCE WAS FOUND BETWEEN SECTIONS 10 AND 15 AND DUE TO SERIOUS GLO CALL DISCREPANCIES."

THIS SURVEY COULD FIND NO TRACE OF A FENCE INTERSECTION IN A FLAT CLEARED FIELD. FOUND THE REBAR SET BY SVENNUNGSSEN VERY CLOSE TO A MIDPOINT BETWEEN 1/4 CORNERS TO THE NORTH AND SOUTH. A CALCULATED DOUBLE PROPORTION CORNER, USING 1/4 CORNERS NORTH AND SOUTH AND SECTION CORNERS 1 MILE EAST AND WEST FOR CONTROL, WOULD FALL S87-36-25W, 33.14 FEET FROM SVENNUNGSSEN'S REBAR. ALTHOUGH RELIANCE ON SVENNUNGSSEN'S SURVEY IS NOT LONG-LIVED, IT NONE THE LESS EXISTS. SECTION 5-46 OF THE 1973 BLM MANUAL OF SURVEYING INSTRUCTIONS, WHICH STATES THAT RULES CANNOT BE ELABORATED TO RECONSTRUCT A MAINLY FICTITIOUS SURVEY, CAN BE A DEFENCE FOR THE METHOD EMPLOYED BY SVENNUNGSSEN. HIS REBAR IS ACCEPTED AS A REASONABLE LOCATION FOR A MISSING CORNER IN A LARGELY FRAUDULENT TOWNSHIP.

THIS SURVEY REPLACED THE SVENNUNGSSEN REBAR WITH A STANDARD DNR ALUMINUM MONUMENT AND DROVE A FIBERGLASS WITNESS POST ALONGSIDE. THE CORNER LIES 95 FEET NORTH OF AN EAST WEST ROW OF FENCE POSTS WITH DOWN WIRE.



Empey Survey – Benson Syndicate Retracement

Sections 2 – 24, T29N, R39E, Willamette Meridian

See the map on the previous page.

The corner of sections 10, 11, 14, and 15 is an example of using a fence corner of unknown origin. The fence corner is at the northeast corner of a field with two houses (see image to the right). A double proportioned position would have put the corner inside the field.

J17 SOUTHEAST CORNER SECTION 10.

FOUND CORNER AND SET NEW MONUMENT.

IN 1883 GLO SURVEYOR, WENCEL H. PLACHY, REPORTED THAT HE SET A STONE WITH 2 BEARING TREES.

ERNEST GEHRKE, LOCAL LANDOWNER, REPORTS THAT IN THE 1940'S, WHEN HE WAS RUNNING LINES BETWEEN SECTIONS 15 AND 14 AND BETWEEN SECTIONS 10 AND 11, THERE WAS IN EXISTENCE A FENCE CORNER AT THE NORTHEAST CORNER OF A FIELD. EVERYONE AT THAT TIME ACCEPTED THE FENCE CORNER AS BEING THE CORNER. HE SAYS THAT THERE IS NO ONE LEFT WHO WOULD KNOW MORE ABOUT THE ORIGIN OF THE CORNER.

IN 1956, PER BOISE CASCADE CORNER INFORMATION, A FENCE INTERSECTION WAS FOUND AT THE APPROXIMATE CORNER LOCATION.

IN 1973, PER NOTES SUPPLIED BY FRED F. POYNER, P.E. 12716, A SURVEY CREW WORKING FOR CASCADE SURVEYING AND ENGINEERING FOUND A FENCE INTERSECTION CORNER WITH A HUB TACK IN THE CENTER AND USED IT AS THE SECTION CORNER.

THIS SURVEY FOUND A 3/8" REBAR ALONGSIDE THE FENCE INTERSECTION POST. THE LAND TO THE SOUTHWEST OF THE FENCE CORNER HAS BEEN EXTENSIVELY CLEARED AND TWO HOUSES ARE LOCATED SOUTH OF THE LINE BETWEEN SECTIONS 10 AND 15. THE CLEARING AND FENCING ARE OLD, PRIOR TO 1950. THE HOUSES ARE NOT SO OLD. GREAT RELIANCE HAS BEEN MADE ON THE FENCE CORNER BEING THE SECTION CORNER.

THIS SURVEY REPLACED THE REBAR AT THE FENCE CORNER WITH A STANDARD DNR ALUMINUM MONUMENT AND DROVE A FIBERGLASS WITNESS POST ALONGSIDE.



Empey Survey – Benson Syndicate Retracement

Sections 2 – 24, T29N, R39E, Willamette Meridian

See the map on page 8. At the southeast corner of Section 16 a pipe at a fence corner was accepted. There are several possible origins for the pipe. At the 1/4 corner between Section 13 and 14 a forester approximate corner was rejected. At the 1/4 corner of Sections 15 and 22 an unusual monument with no history in an east west fence was rejected. The monument is north and west of a calculated position. A more recent photo (2003-5) below shows that the rejected monument has been used for a timber harvest. After the DNR survey one surveyor has accepted the DNR calculated corner and another surveyor has accepted the monument rejected by the DNR, resulting in the timber harvest shown in the photo which extends north of the DNR calculated section line. Possibly the DNR made the wrong decision.

N13 SOUTHEAST CORNER SECTION 16.

FOUND CORNER AND SET NEW MONUMENT.

IN 1883 GLO SURVEYOR, WENCEL H. PLACHY, REPORTED THAT HE SET A POST WITH 2 BEARING TREES.

IN 1973, ACCORDING TO BOISE CASCADE INFORMATION, A PIPE WAS FOUND AT A FENCE CORNER.

IN 1973, PER NOTES SUPPLIED BY FRED F. POYNER, P.E. 12716, A SURVEY CREW WORKING FOR CASCADE SURVEYING AND ENGINEERING FOUND A 2" PIPE, 1 BEARING TREE, AND A DEER PARK PINE TAG IDENTIFYING THE PIPE AS THE SECTION CORNER.

IN 1992 CLAUDE DILLON, A LOCAL LAND OWNER, SAYS THE PIPE WAS ESTABLISHED BY A DEER PARK LUMBER COMPANY SURVEY.

IN 1993 LOUIS HUNT, WHO WORKED FOR DEER PARK LUMBER COMPANY SAYS THAT HIS RECORDS INDICATE THAT HE HAD A CORNER BUT NOT AS TO WHETHER HE FOUND OR SET IT. HE ASSUMES, BECAUSE HE HAD A GREAT DEAL OF TROUBLE WITH CORNERS IN THE VICINITY, THAT HE DID NOT SET THE PIPE, BUT RATHER FOUND IT.

IN 1993 E. GEHRKE, A LOCAL LANDOWNER, SAID THAT IN THE 1940'S AN ANDREW SORENSON, WHO OWNED LAND IN SECTION 16, DID SOME SURVEYING USING KNOWN CORNERS ALONG THE SPOKANE INDIAN RESERVATION BOUNDARY AS A STARTING POINT. HE BELIEVES THAT SORENSON MAY HAVE SET THE PIPE WHICH IS NOW MONUMENTING THE CORNER.

THIS SURVEY FOUND THE 3" O.D. PIPE 4.8 FEET SOUTH OF A NORTH-SOUTH-WEST FENCE INTERSECTION. THE PIPE IS ACCEPTED AS BEING THE BEST EVIDENCE OF THE CORNER.

THIS SURVEY REPLACED THE PIPE WITH A STANDARD DNR ALUMINUM MONUMENT AND DROVE A FIBERGLASS WITNESS POST ALONGSIDE.

N15 1/4 CORNER BETWEEN SECTIONS 15 and 22

1883 - GLO, WENCEL H. PLACHY REPORTED THAT HE SET A STONE WITH A MOUND OF STONE ALONGSIDE AND WITH NO BEARING TREES. THE GLO NOTES SHOW THAT THIS CORNER WAS NOT SET AT A MIDPOINT BUT 39.60 CHAINS FROM THE SECTION CORNER TO THE EAST AND 40.00 CHAINS FROM THE SECTION CORNER TO THE WEST.

1992 - MR. DAUD OF MUSLIM AMERICA INC., A LANDOWNER TO THE SOUTHWEST, SAYS THAT THE CORNER IS MARKED BY A STEEL SHAFT WITH A TRIANGULAR STEEL PLATE ATTACHED JUST ON THE NORTH SIDE OF AN EAST-WEST FENCE.

1992 - DNR FOUND A FENCE POST WITH DOWNED WIRE RUNNING EAST AND WEST AND WITH NO OTHER POSTS VISIBLE (THERE WAS 18" OF SNOW). A 3/8" METAL ROD WITH A TRIANGULAR PLATE WAS IN THE GROUND ALONGSIDE THE FENCE POST. NO SECTION CORNER WAS FOUND TO THE EAST. THE CORNER TO THE WEST IS A VERY POOR FIT, S85 38 53W 2558.8 FEET AGAINST A GLO RECORD OF S87-34W 40 CHAINS = 2640 FEET ACCORDING TO NOTES (OR 39.80 CHAINS ACCORDING TO PLAT). THE LAND NEAR THE CORNER HAS NOT BEEN DEVELOPED. IT IS NOT FELT THAT THE FENCE CORNER FITS WELL ENOUGH TO BE EITHER THE ORIGINAL CORNER OR A GOOD FAITH LOCATION OF THE CORNER.

CALCULATED CORNER ONLY. DID NOT SET ANYTHING AS IT DOES NOT CONTROL ANY STATE LAND.

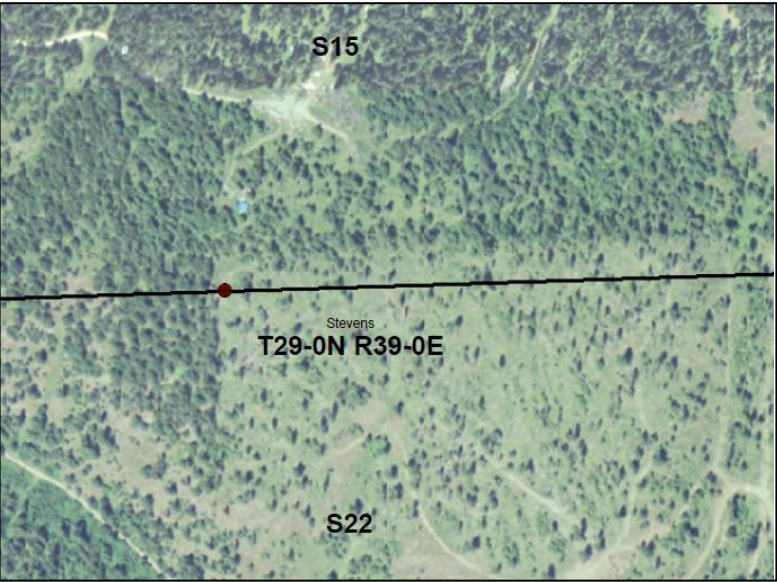
L21 1/4 CORNER BETWEEN SECTIONS 14 AND 13.

CALCULATED AND SET CORNER.

IN 1883 GLO SURVEYOR, WENCEL H. PLACHY, REPORTED THAT HE SET A STONE WITH TWO BEARING TREES.

IN 1968 DNR EMPLOYEES AL LANG AND ELDON THOMPSON SURVEYED THE SOUTH HALF OF SECTION 14 USING ONLY THE TWO CORNERS ON THE SPOKANE INDIAN RESERVATION LINE, 18.5 CHAINS SOUTH OF SECTION 14, AS CONTROL. THEY SET A MOUND OF STONE AT AN APPROXIMATE CORNER POSITION.

THIS SURVEY FOUND THE 1968 MOUND OF STONE WITH A WOOD POST SET AND A 1968 TAG MARKED "APPROX COR." SET A STANDARD DNR ALUMINUM MONUMENT AT A POSITION SINGLE PROPORTIONED BETWEEN SECTION CORNERS NORTH AND SOUTH AND DROVE A FIBERGLASS WITNESS POST ALONGSIDE. THE CORNER FALLS N30-43-08W, 124.11 FEET FROM THE WOOD POST. REMOVED THE WOOD POST.



South Pass Road & Aspen Six – Closing Corners and Closing Sections

Section 6, T40N, R6E, and Section 6, T36N, R5E, Willamette Meridian

South Pass Road – Section 6, T40N, R6E

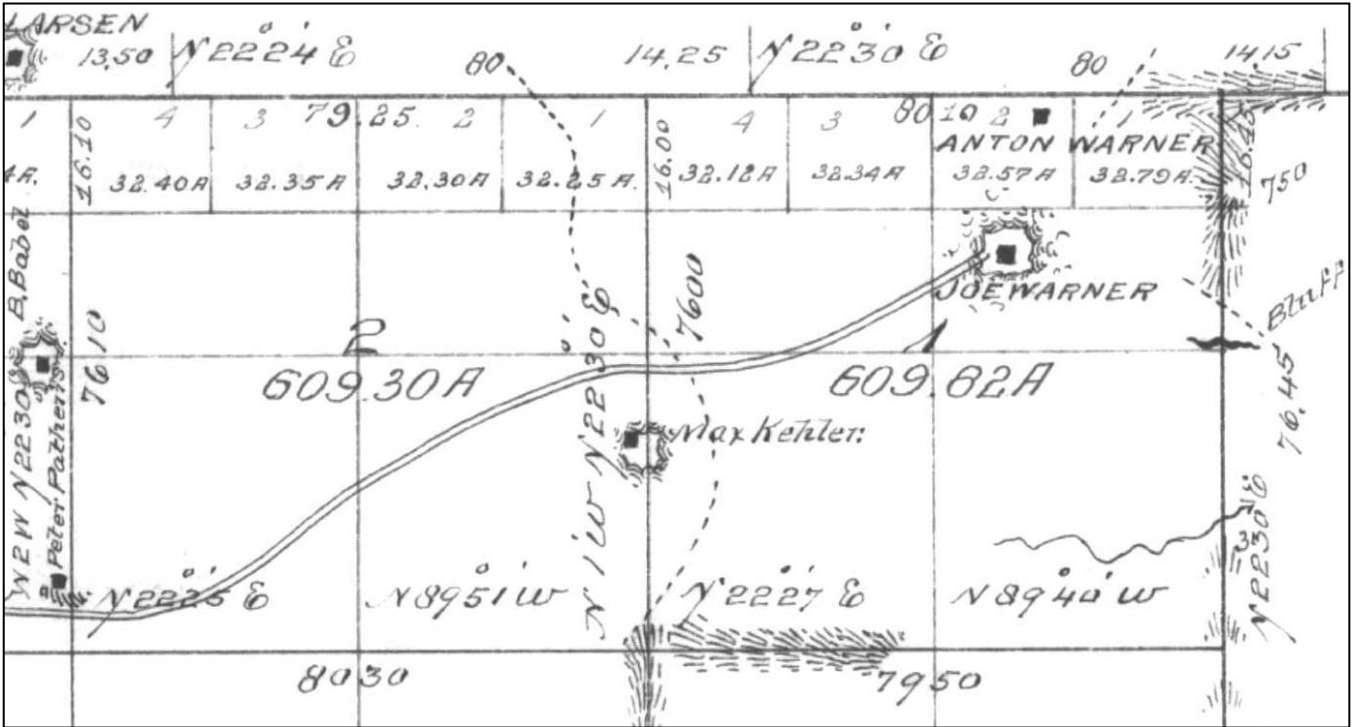
Louis P. Ouellette surveyed the 10th Standard Parallel through Range 5 East in 1890 and subdivided T40N, R5E, in 1891. Isaac M. Galbraith surveyed the 10th Standard Parallel through Range 6 East and subdivided T40N, R6E, in 1893. The DNR survey is in Sections 1 and 6 below and the retracement of the 10 Standard parallel extends from the south quarter corner of Section 35, T41N, R5E, to the Standard Corner of Sections 32 and 33, T41N, R6E. This survey illustrates the retracement of lost corners along a township line, the subdivision of closing sections, and the subdivision of section 6.

T40N, R5E

SURVEYS DESIGNATED	BY WHOM SURVEYED	CONTRACT		AMOUNT OF SURVEYS			WHEN SURVEYED	MEAN DECLINATION
		NO.	DATE.	MS	CHS	L.S.		
Survey Tenth St. Par.	Louis P. Ouellette.	346	June 23 rd 1890	6	00	00	Commenced:	22° 24' E.
Survey East Bd.	" "	"	" "	5	76	45	August 18 th '91	
Resurvey fr. W. Bd.	" "	"	" "	4	00	95	Completed:	
Section lines	" "	"	" "	52	67	11	Oct. 14 th 1891	
Connection lines	" "	"	" "	1	18	98		
Meander lines	" "	"	" "	—	57	56		

T40N, R6E

Surveys Designated.	By Whom Surveyed	Date of Contract	Amount of Surveys			When Surveyed	Mean declination
			M.	Ch. ^s	Lk. ^s		
10 th Sta. P.M. N	Isaac M. Galbraith	N ^o 399 June 28, 1892	6	0	0	July 27–Sept 19 1893	22° 25'–22° 30' E
Township lines	" "	" "	11	76	95		
S-E. 40ys. Subdivisions	" "	" "	59	63	23		
Meanders	" "	" "	18	18	20		
Connections	" "	" "	1	9	27		



South Pass Road & Aspen Six – Closing Corners and Closing Sections

Section 6, T40N, R6E, and Section 6, T36N, R5E, Willamette Meridian

There are several ways figure the parenthetical distances for section 6. Not all will give the correct answer. The two parentheticals needed to subdivide section 6 and missing from the plat are the record distance between lots 2 and 3 (from the C-N 1/16 to the N 1/4 corner) and the record distance between lots 5 and 10 (from the C-W 1/16 to the W 1/4 corner).

Method 1: Divide the sum of the adjoining lot acreages by 4.

Method 2: Subtract a known parenthetical from the lot acreage to get the parenthetical on the other side of the lot.

Method 3: Divide the sum of the parentheticals on opposite section lines by 2.

Method 4: Proportion the parenthetical between parentheticals on opposite section lines based on the uncentered position of the unknown parenthetical. See the 1894 GLO Manual for instructions on how to do the calculations.

All distances below are in chains.

The record distance between lots 2 and 3:

1. $(32.75 + 32.81) / 4 = 16.390$
2. $32.70 - 16.34 = 16.36$; $32.75 - 16.36 = 16.390$
3. $(16.34 + 16.45) / 2 = 16.395$
4. $16.34 + [(40 / 79.23) * (16.45 - 16.34)] = 16.3955$

The correct answer is #1 or #2 above.

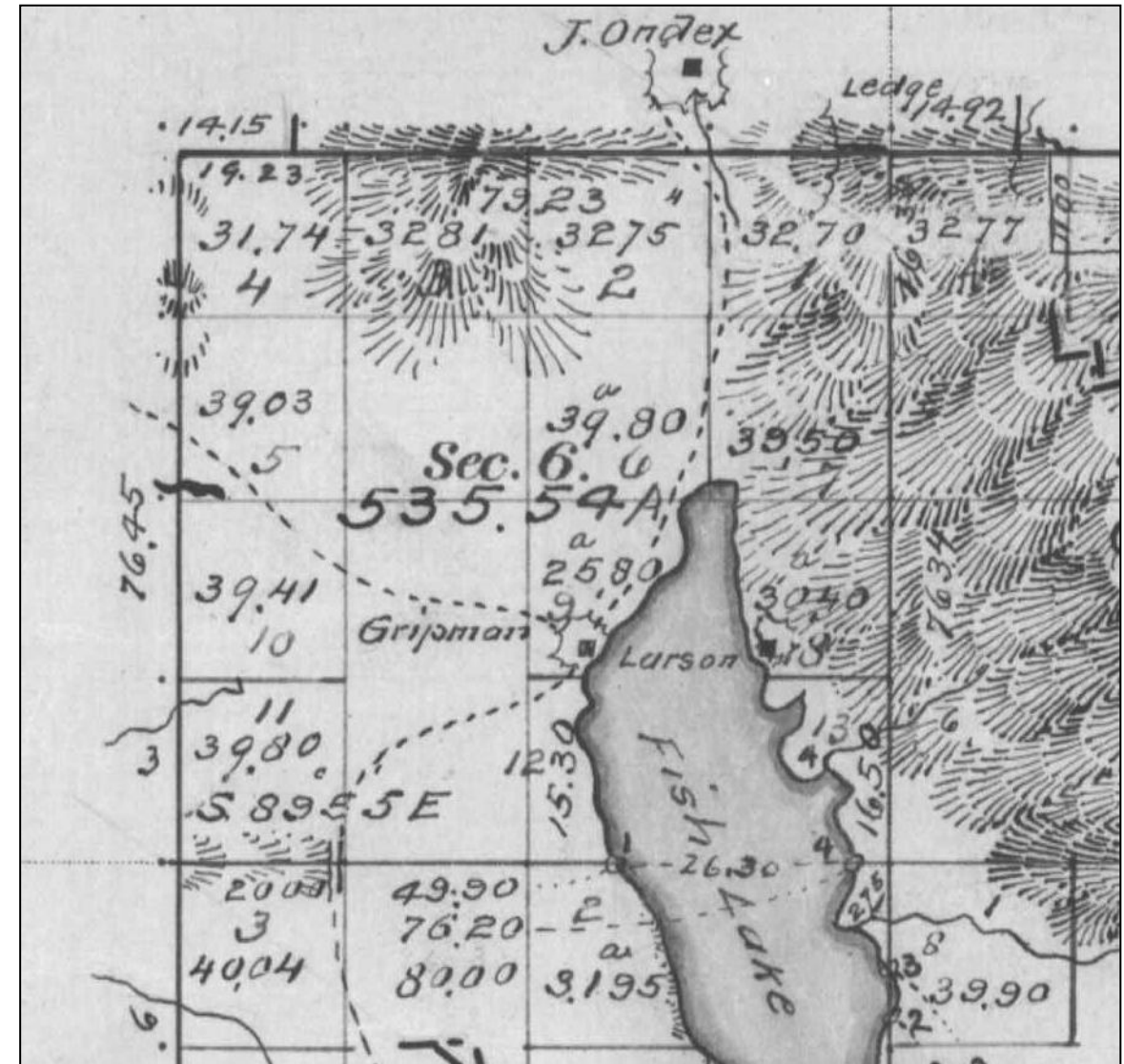
The record distance between lots 5 and 10:

1. $(39.03 + 39.41) / 4 = 19.610$
2. $39.80 - 20 = 19.80$; $39.41 - 19.80 = 19.610$
3. $(20 + 19.23) / 2 = 19.615$
4. $20 - [(40 / 76.45) * (20 - 19.23)] = 19.597$

The correct answer is #1 or #2 above.

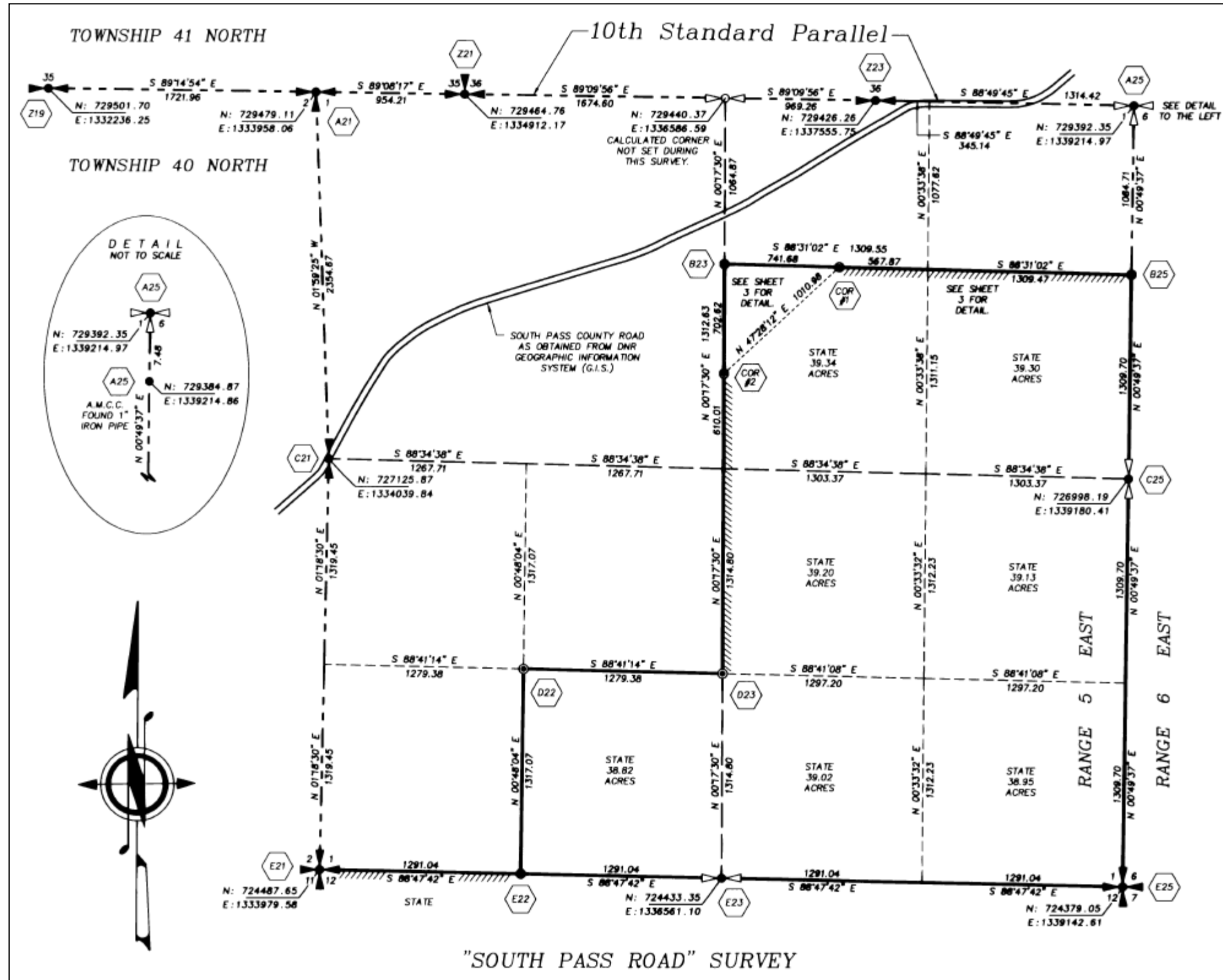
Method 3 above can work in closing sections other than a section 6 and sometimes in section 6.

Method 4 above is an enhanced method that is used in section 6 in some plats beginning sometime in the 1880's.

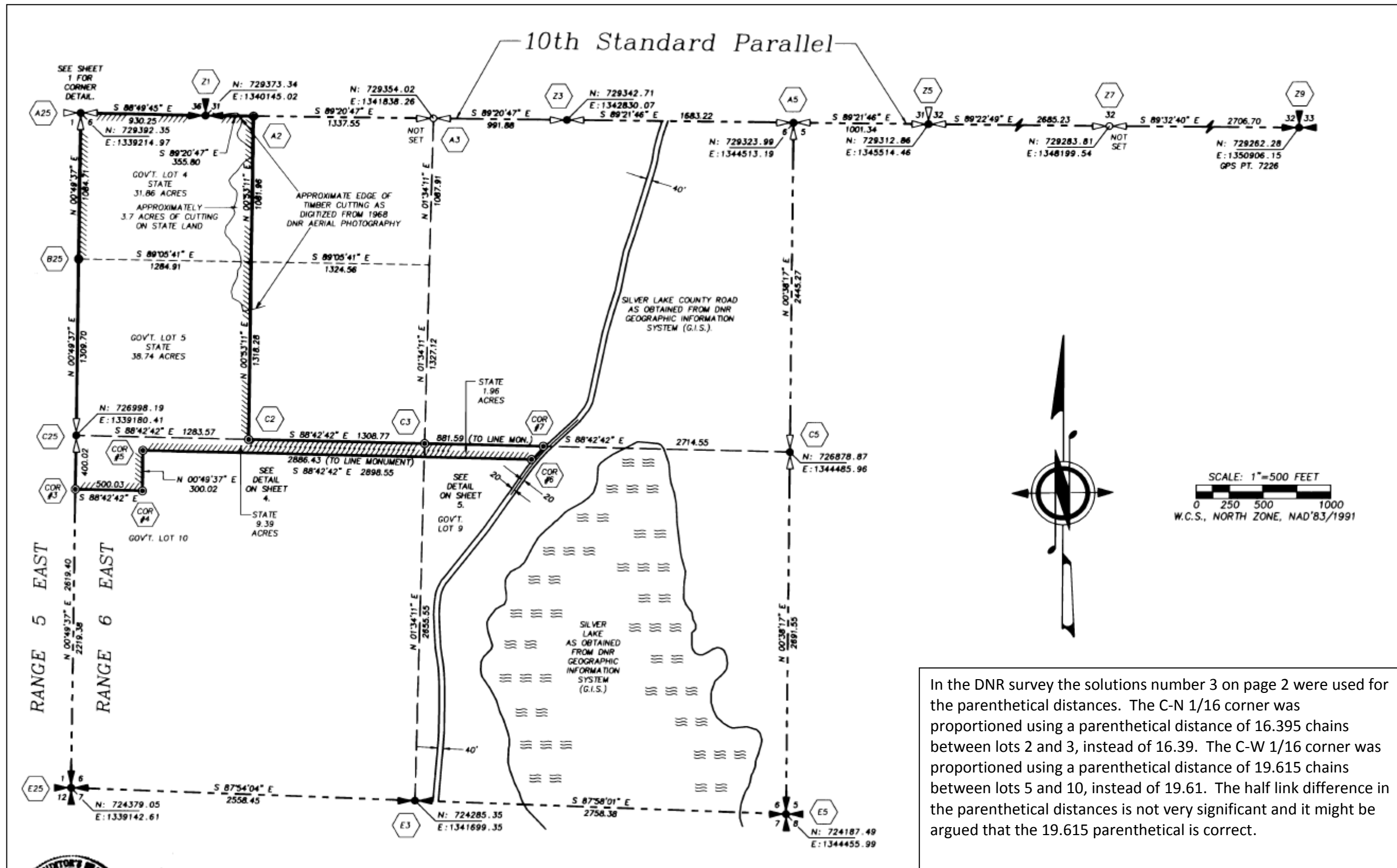


South Pass Road & Aspen Six – Closing Corners and Closing Sections

Section 6, T40N, R6E, and Section 6, T36N, R5E, Willamette Meridian



Section 6, T40N, R6E, and Section 6, T36N, R5E, Willamette Meridian



South Pass Road & Aspen Six – Closing Corners and Closing Sections

Section 6, T40N, R6E, and Section 6, T36N, R5E, Willamette Meridian



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
OREGON STATE OFFICE
P.O. BOX 2965 (825 NE MULTNOMAH STREET)
PORTLAND, OREGON 97208

SEP 26 1988



IN REPLY REFER TO:

9626 (942)

September 20, 1988

Mr. Frank Fischer, Regional Surveyor
Washington State Dept. of Natural Resources
Northeast Area Office
225 S. Silke Road, P.O. Box 190
Colville, WA 99114

Dear Mr. Fischer:

This is in reply to your letter, dated September 8, 1988, in which you have inquired about procedures for establishing a $\frac{1}{4}$ section corner on a standard parallel between closing corners, and establishing a center N $\frac{1}{16}$ section corner based on such a $\frac{1}{4}$ corner during section subdivision.

You have asked what the rules are for these situations. In response to this question, we do not believe there are any official rules or legal opinions on this subject. Sections 5-35(2) and 5-41 of the 1973 Manual provide guidelines for treating closing corners, but do not specifically address the subject of your inquiry. That which follows is the procedural policy of this office, based on Manual interpretations, and the principles of honoring the intent of the original plat and protecting the bona fide rights acquired with patents based on that plat. It is our understanding that this same policy is followed throughout the Bureau.

Given the situation you have presented, this office would first determine the true intersection points of the closing lines with the standard parallel (true points for the closing corners). The $\frac{1}{4}$ section corner on the north boundary of a section south of the standard would then be established at midpoint or proportionate distance longitudinally between the true points for the closing corners, and latitudinally on the standard parallel as defined by the nearest standard corners on either side. The center N $\frac{1}{16}$ section corner for the section to the south would then be established at a proportionate position, based on the section lotting, between the center $\frac{1}{4}$ and the above established $\frac{1}{4}$ section corner on the standard.

The basic rationale for using these procedures follow:

1. The legal terminus for a closing line is at the intersection with the line closed upon (standard parallel in this case). The areas calculated for lots 1 through 4 of a section to the south were determined based on physical measurements along the closing lines to

2

the intended intersection with the standard, where closing corners were set. The bona fide rights acquired with any patents to lots 1 through 4 were meant to extend to the standard parallel as defined by the standard corners, not the original closing corners.

2. Closing corners were established in the course of measuring a closing line on which other corners were physically set or protracted ($\frac{1}{4}$ and N $\frac{1}{16}$ corners in this case). As prescribed by Section 5-41 of the Manual, a found original closing corner must control the establishment or reestablishment of corners dependent on its position, i.e., corners along the closing line. This principle however has no effect on the concept that the legal terminus of this line, and the northerly limit of lots 1 through 4, is defined by the standard parallel, regardless of the actual position of the original closing corners.
3. Section 5-35(2) of the Manual states, "... the corners first established control both the alignment and the proportional measurement along the line." We interpret this to mean that the corners (standard corners, etc.) controlling the line closed upon, being first set, control the distance for a $\frac{1}{4}$ section corner on the north boundary of a section to the south, even though this corner wasn't originally monumented.
4. Using the true intersection point for a recovered closing corner is consistent with the procedure that would be used if the original closing corner was lost.

With respect to a center N $\frac{1}{16}$ section corner, the true points for the closing corners are the northeast and northwest corners of the section to the south, which in turn control the longitudinal length of the north boundary of lots 1 through 4. Inasmuch as the original intent was to have the north terminus of the north and south center line (north $\frac{1}{4}$ corner) on the standard parallel and this point was never monumented, it is followed by the BLM that this point should be controlled longitudinally by the true intersection points of the closing corners. This point would then control a center N $\frac{1}{16}$ section corner to the south.

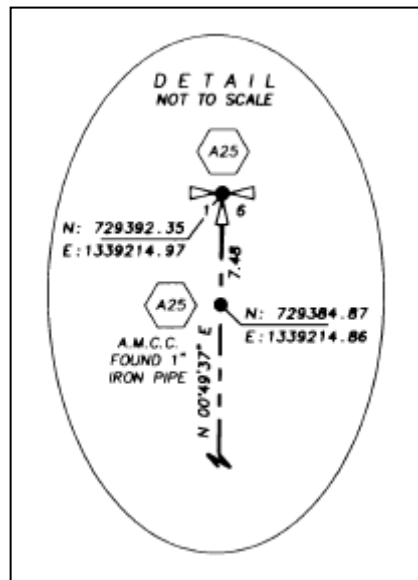
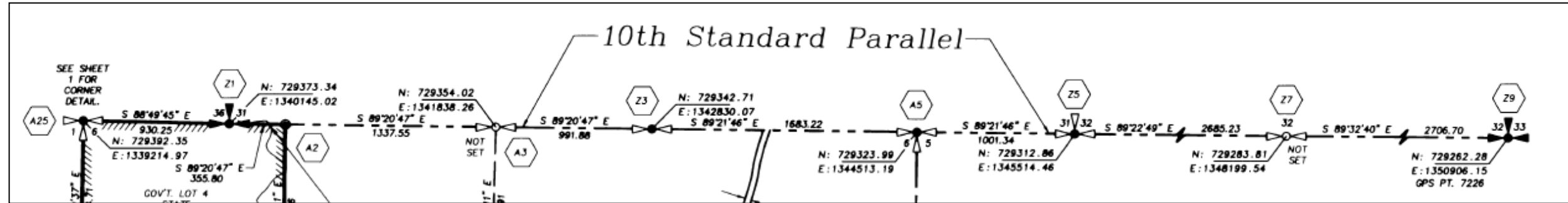
We hope this information helps explain the BLM policy on this subject.

Sincerely,

Wayne M. Gardner
Chief, Branch of Cadastral
Survey

South Pass Road & Aspen Six – Closing Corners and Closing Sections

Section 6, T40N, R6E, and Section 6, T36N, R5E, Willamette Meridian



The BLM letter on the previous page instructs to use the north quarter corner position on the township line (never set by the GLO) as an endpoint for the proportioning of the C-N 1/16 corner of section 6. The DNR survey used that procedure. A procedure advocated by some outside the BLM is to use the "theoretical position" for the north quarter corner on a straight line between the original closing corners. Many surveys, including some by DNR, have been performed using that alternate procedure. In this case the northwest corner of section 6 is 7.48 feet north of the township line and the northeast corner of the section is lost. The DNR survey proportioned the quarter corner on a straight line between the true section corners on the township line and offset that position to the township line. The resulting position shown on the map as "A3" was used to calculate the C-N 1/16 corner.

On this survey all corners on the township line between Z1, the standard section corner of sections 36 and 31, and Z9, the standard section corner of sections 32 and 33, were lost. Each standard corner was proportioned along the latitudinal curve. The closing corners were proportioned on a straight line connecting the standard corners. It could be argued that the closing corners should be adjusted to the latitudinal curve. It could also be argued that within a half mile the offset to the latitudinal curve is so small as not to be worth the worry.

South Pass Road & Aspen Six – Closing Corners and Closing Sections

Section 6, T40N, R6E, and Section 6, T36N, R5E, Willamette Meridian

Aspen Six – Section 6, T36N, R5E

In 1890 Louse P. Ouellete subdivided T36N, R5E, creating irregular section 6. The section is significantly long in the north south direction resulting in the method of the 1894 manual to be used to more accurately compute the parenthetical distance between lots 5 and 6.

Fractl. E. Bkys. Surveys Designated	By Whom Surveyed	Date of Contract	Amount of Surveys M. Ch. ^s Lk. ^s	When Surveyed	Mean Declination
Township lines	Louis P. Ouellette	*346-June 23 rd	3 - 78 30	Sept. 28, 1890	23°00' E.
Subdivisions	" " "	1890	46 63 90	to Nov. 16, 1890	
Meanders	" " "		7 34 15		
Connections			18 72		

Calculate the parenthetical distance between lots 2 and 3.

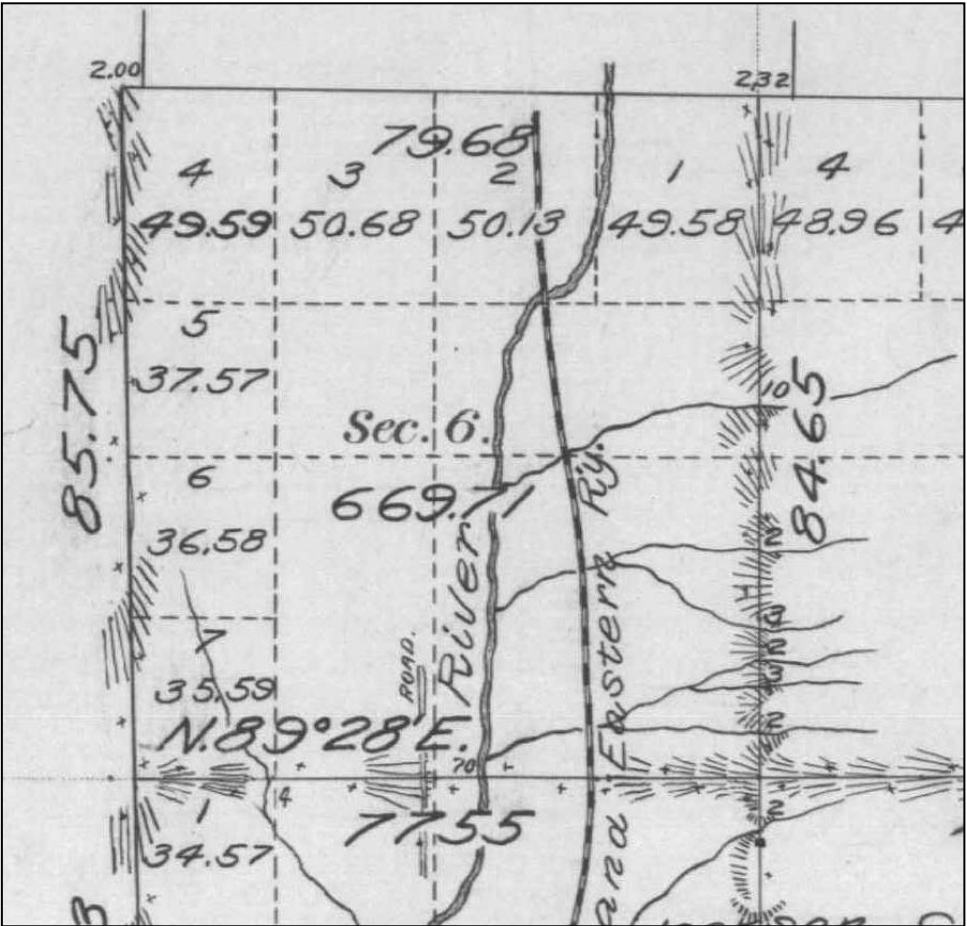
1. $(50.68 + 50.13) / 4 = 25.203$
2. $49.58 - 24.65 = 24.93$; $50.13 - 24.93 = 25.200$
3. $(24.65 + 25.75) / 2 = 25.200$
4. $24.65 + [(40 / 79.68) * (25.75 - 24.65)] = 25.202$

The correct answer is 25.20 and all four methods provide essentially the same answer.

Calculate the parenthetical distance between lots 5 and 6.

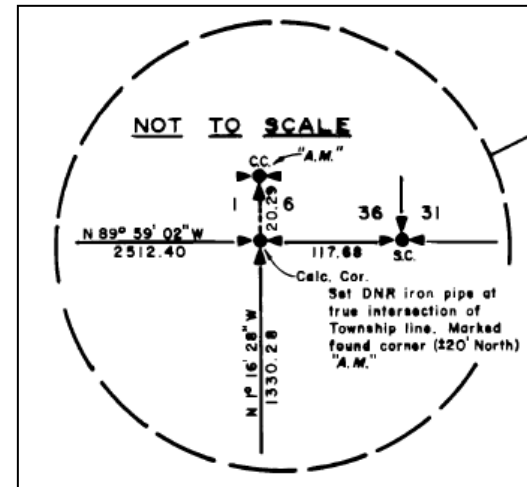
1. $(37.57 + 36.58) / 4 = 18.538$
2. $35.59 - 17.55 = 18.04$; $36.58 - 18.04 = 18.540$
3. $(17.55 + 19.68) / 2 = 18.615$
4. $17.55 + [(40 / 85.75) * (19.68 - 17.55)] = 18.544$

The correct answer is 18.54 and method 2 provides the answer with methods 1 and 4 corroborating the answer. Probably method 4 was used and the answer rounded to the nearest link. Method 3, which is used often as the default method, provides the wrong answer in this case.



South Pass Road & Aspen Six – Closing Corners and Closing Sections

Section 6, T40N, R6E, and Section 6, T36N, R5E, Willamette Meridian



A private survey subdivided the northwest quarter of section 6. The survey used the correct parenthetical distance, 18.54 chains between lots 5 and 6, to calculate the C-W 1/16 corner.

The calculation of the C-N 1/16 corner seems to be wrong. The distance between the Center 1/4 corner and the North 1/4 corner is 3129.58. Using the parenthetical from the previous page, 25.20 chains between lots 2 and 3, the proportion should be as follows.

C 1/4 to C-N 1/16:

$$(20 / 45.20) * 3129.58 = 1384.77$$

C-N 1/16 to N 1/4:

$$(25.20 / 45.20) * 3129.58 = 1744.81$$

The distances on the survey are different. Notice that the GLO closing corner for the northwest corner of the section is 20.29 feet north of the true section corner on the township line. The northeast closing corner, not shown on this map, was lost and its restored position is on the township line. A temporary proportioned N 1/4 for section 6 is 10.19 feet north of the final position shown on the map. If that position is used to subdivide the section the answers are as follows.

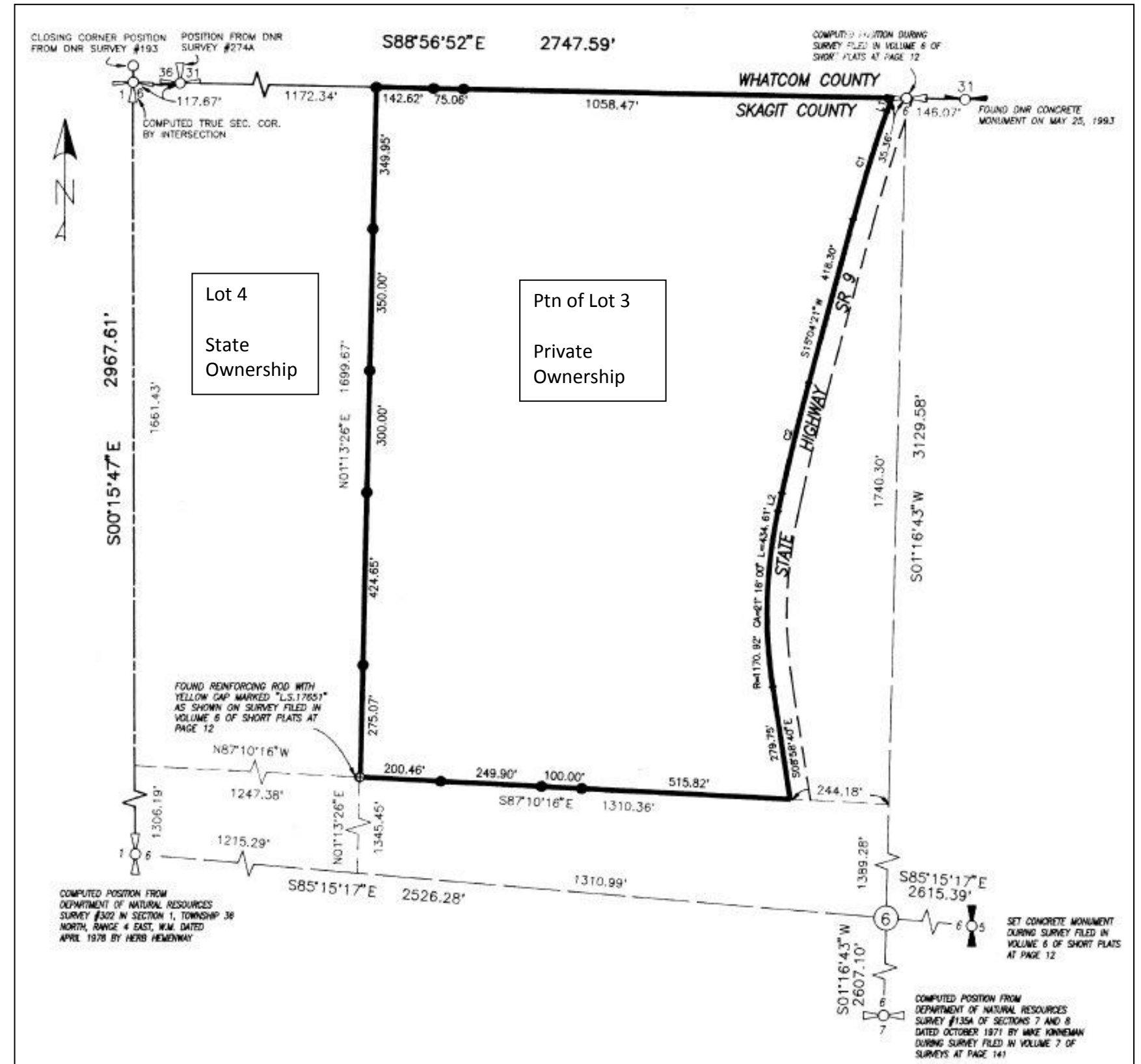
C 1/4 to C-N 1/16:

$$(20 / 45.20) * (3129.58 + 10.19) = 1389.28$$

C-N 1/16 to N 1/4:

$$(25.20 / 45.20) * (3129.58 + 10.19) = 1750.49 - 10.19 = 1740.30$$

The private survey used the alternate method, discussed on page 6, for calculating the C-N 1/16 corner. The private survey corners were accepted as the corners of state ownership in Lot 4.

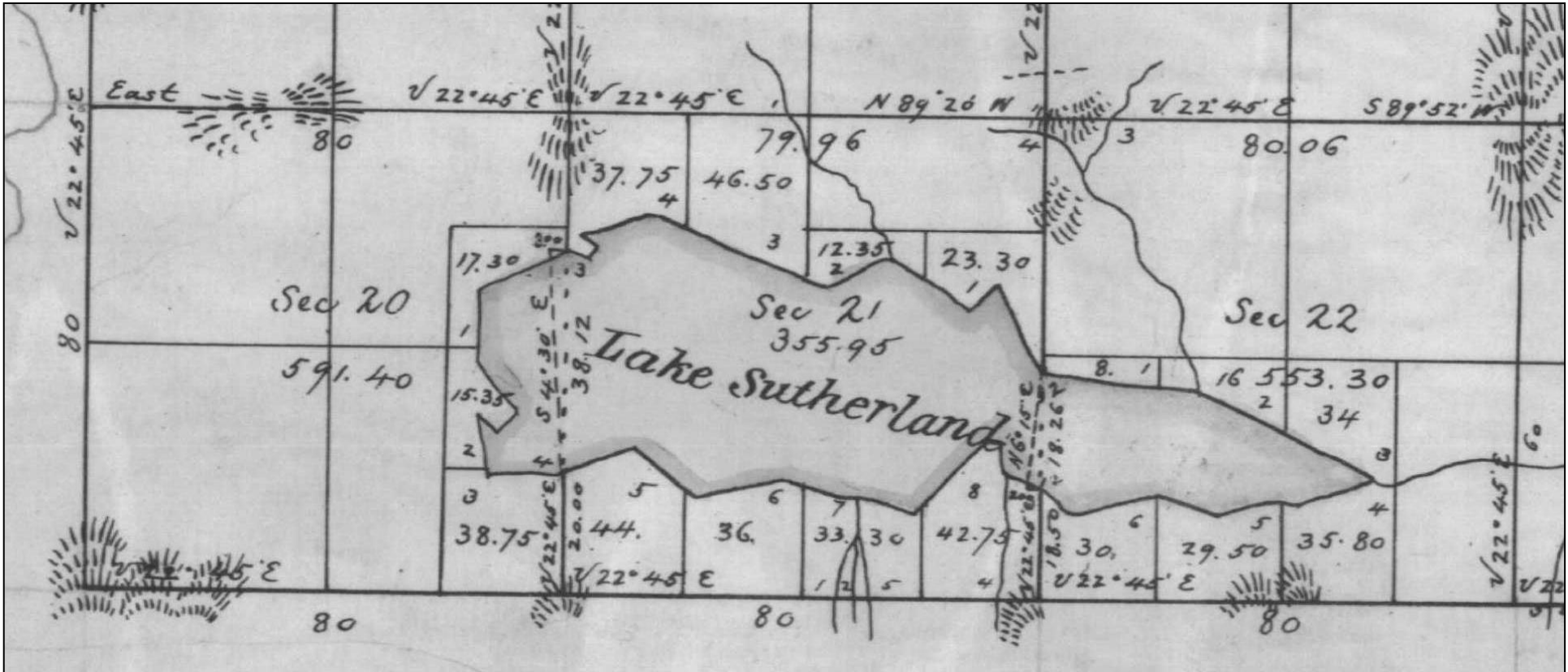


Sutherland Ridge – Quarter Corner in Water

Section 20 , T30N, R8W, Willamette Meridian

In 1879 Ross P. Shoecraft subdivided part of T30N, R8W, creating section 20. The quarter corner position of sections 20 and 21 fell in Lake Sutherland leaving the quarter corner without a monument. The entire line between sections 20 and 21 was measured and meander corners were set on the north and south sides of the lake.

Total number of Acres 13.				
Surveys Designated	By Whom Surveyed	Date of Contract	Amount of Surveys	When Surveyed
(W. bdy.) Township lines	Ross P. Shoecraft	16 th Sept 1878	M. 2 Chs 00 Lks 12	18 th Dec 1879
Subdivisions	" " "	" " "	42. 4 57	" " "
Meanders	" " "	" " "	5 4 80	" " "



Sutherland Ridge – Quarter Corner in Water
Section 20 , T30N, R8W, Willamette Meridian

The subdivision method for fractional sections was established by congress in 1805. The surveyors-general have always interpreted the congressional instruction to survey on a cardinal line when an opposite corner cannot be “fixed” as an instruction to follow a parallel or mean course as the circumstances dictate. The question as to what it means for a corner to be “fixed” has plagued surveyors ever since.

Act of February 11, 1805

—————	STATUTE II.
CHAP. XIV.— <i>An Act concerning the mode of surveying the Public Lands of the United States.</i> (a)	Feb. 11, 1805.
<i>Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,</i> That the surveyor-general shall cause all those lands north of the river Ohio, which, by virtue of the act, intituled “An act providing for the sale of the lands of the United States, in the territory northwest of the river Ohio, and above the mouth of the Kentucky river,” were subdivided, by running through	Act of May 18, 1796, ch. 29. Mode of surveying public lands north of the Ohio.

Boundary lines not actually run to be ascertained.	And the boundary lines, which shall not have been actually run, and marked as aforesaid, shall be ascertained, by running straight lines from the established corners to the opposite corresponding corners; but in those portions of the fractional townships, where no such opposite corresponding corners have been or can be fixed, the said boundary lines shall be ascertained, by running from the established corners, due north and south, or east and west lines, as the case may be, to the water-course, Indian boundary line, or other external boundary of such fractional township.
--	--

1973 Manual of Surveying Instructions

Subdivisions of Fractional Sections


3–88. The law provides that where opposite corresponding quarter-section corners have not been or cannot be fixed, the subdivision-of-section lines shall be ascertained by running from the established corners north, south, east, or west, as the case may be, to the water course, reservation line, or other boundary of such fractional section, as represented upon the official plat.

In this the law presumes that the section lines are due north and south, or east and west lines, but usually this is not the case. Hence, in order to carry out the spirit of the law, it will be necessary in running the center lines through fractional sections to adopt mean courses where the section lines are not on due cardinal, or to run parallel to the east, south, west, or north boundary of the section, as conditions may require, where there is no opposite section line.

Sutherland Ridge – Quarter Corner in Water

Section 20 , T30N, R8W, Willamette Meridian

The examples below from a letter of the Oregon State Office of the BLM indicate that if a section line was never measured the quarter corner cannot have been fixed and the section centerline must be surveyed on a mean bearing. However, if the section line was measured and the quarter corner position fell in a navigable body of water the quarter corner can be either “not fixed” or “fixed” by the measurement. The Oregon Office leans toward preferring to call the corner “fixed” and calculate its position in the body of water.



IN REPLY REFER TO:

9626 (OR 957)
Sub. of Frac. Secs

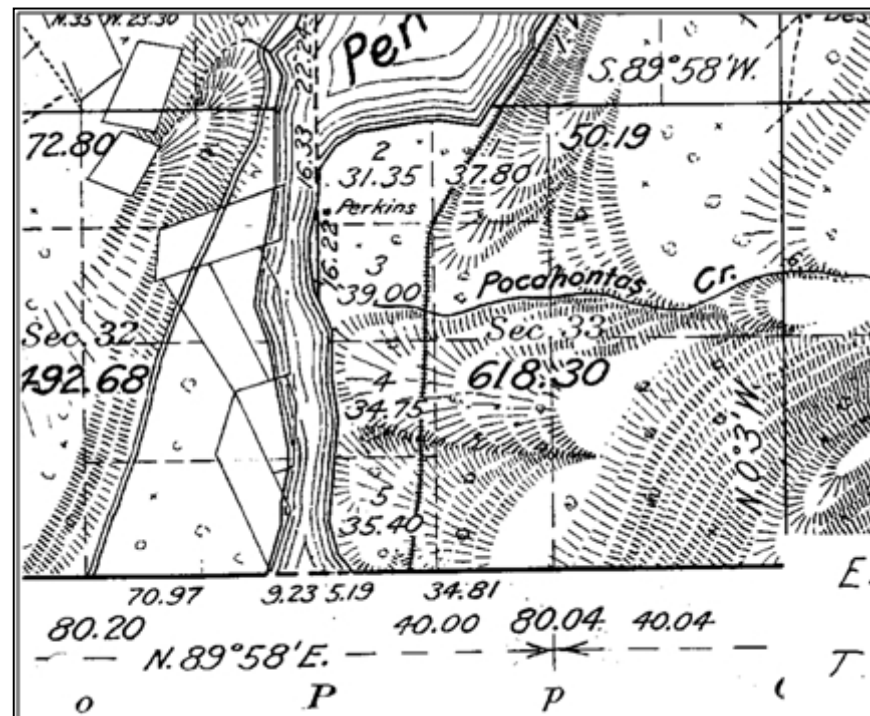
June 9, 1997

United States Department of the Interior

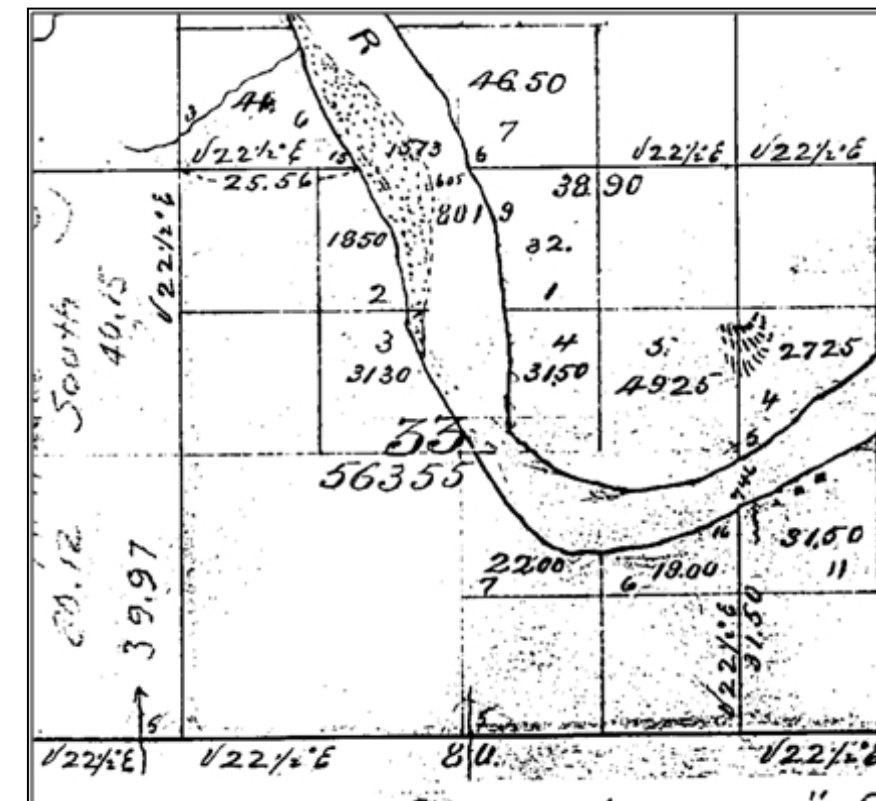
BUREAU OF LAND MANAGEMENT

Oregon State Office
P.O. Box 2965
Portland, Oregon 97208

Enclosure “D” is of section 33, T. 39 N., R. 43 E., W.M., Wa. A private surveyor requested our advice for the subdivision of this section. This is a fractional section because the northwest section corner and west 1/4 section corner fall in the river and major portions of the north and west boundaries were not surveyed. The east and west center line is based on a weighted mean bearing of the resurveyed north and south section boundaries. The private surveyor found the original survey to have been performed accurately enough that he could calculate the proportionate position for the center W 1/16 section corner based on the meanders and lot areas. If the original survey had not been accurate enough to determine a proportionate basis, then the normal alternate procedure would have been to establish the center W 1/16 corner at 20 chs. from the center 1/4 corner.



Enclosure “E” is of section 33, T. 35 N., R. 9 E., W.M., Wa. A private surveyor requested our advice for the subdivision of this section. He proposed surveying the north and south center line on a mean bearing because the north 1/4 section corner had not been “fixed” in the original survey. We advised that this was an acceptable procedure, but that in this case, he could consider establishing (fixing) the north 1/4 corner at proportionate distance between meander corners because the original surveyor measured across the river. He said that proportioning the 1/4 corner would actually be a better solution because it would result in better equity.



Sutherland Ridge – Quarter Corner in Water

Section 20 , T30N, R8W, Willamette Meridian

The 1998 DNR survey found the section to have been previously subdivided using BLM advice to ignore the meander corners for distance in fixing the quarter corner in the body of water. The meander corners were held for line but not for distance. The normal procedure now is to use the meander corners for distance control also in proportioning the corner in water.

P9

EAST QUARTER CORNER SECTION 20

CALCULATED CORNER EVIDENCE FOUND:

—NONE, THIS CORNER WAS NOT SET BY THE ORIGINAL GLO SURVEY AS IT FALLS IN LAKE SUTHERLAND.

CORNER COMPUTATION:

—THIS POSITION MUST BE CALCULATED IN ORDER TO SUBDIVIDE SECTION 20. TO DATE, TWO METHODS HAVE BEEN USED BY PRIVATE SURVEYORS.

—IN A LETTER DATED MARCH 3, 1959 BY J.U. WRIGHT PLS 4233 TO THE BUREAU OF LAND MANAGEMENT, WRIGHT ASKED FOR AN ADVISORY OPINION REGARDING THE SUBDIVISION OF SECTION 20, AND THE CALCULATION OF THE EAST QUARTER CORNER.

—THE REPLY CAME FROM L.M. BERLIN, AREA CADASTRAL ENGINEERING OFFICER, U.S.B.L.M. ADVISING MR. WRIGHT THAT HIS OFFICE WOULD LIKELY CALCULATE A POSITION FOR THE CORNER AT A MID-POINT BETWEEN THE FOUND SECTION CORNERS AND IGNORE THE FOUND NON-TERMINAL MEANDER CORNERS FOR PROPORTIONING PURPOSES.

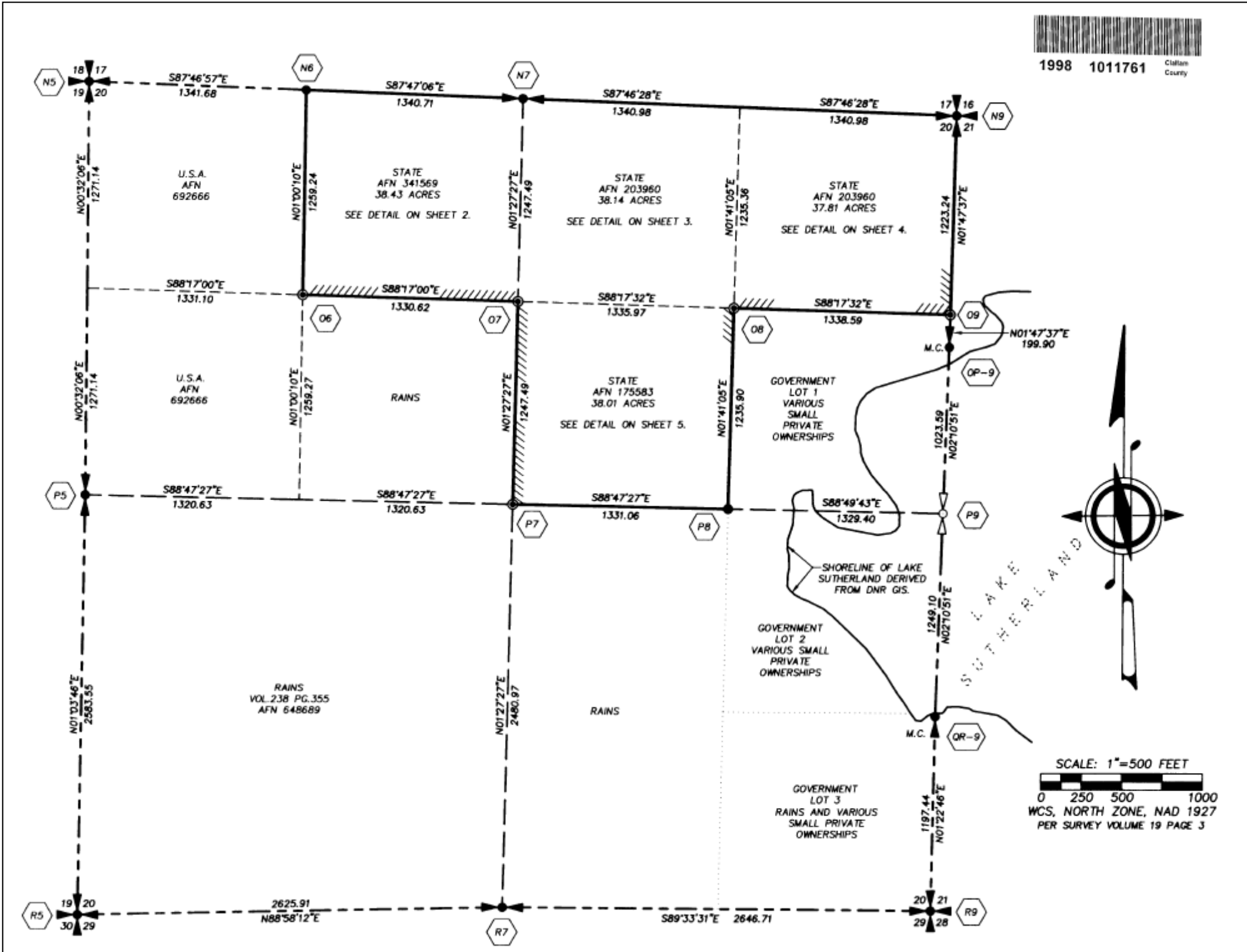
—IN 1959 J.U. WRIGHT PLS 4233 FOLLOWED THE ADVICE OF THE BLM FOR HIS WORK IN SECTION 20.

—IN 1963 G. ROATS PLS 4809 MADE A SUBDIVISION OF SECTION 20. ROATS ALSO PROPORTIONED THE EAST QUARTER CORNER OF SECTION 20. ROATS HELD THE FOUND MEANDER CORNERS FOR HIS WORK IN SECTION 20 INSTEAD OF THE SECTION CORNERS RESULTING IN A DRASTICALLY DIFFERENT POSITION FOR THE CORNER AND CONSEQUENTLY FOR THE LINES OF THE GOVERNMENT LOTS IN SECTION 20.

—A DISPUTE ENSUED BETWEEN PROPERTY OWNERS IN GOVERNMENT LOTS 2 AND 3; IN 1966 IN THE CLALLAM COUNTY COURT CAUSE NO. 15982 FIXED THE BOUNDARIES OF GOVERNMENT LOTS 2 AND 3 UTILIZING THE 1959 METHOD DESCRIBED ABOVE BY MR. BERLIN OF THE BLM AND USED BY J.U. WRIGHT PLS 4233.

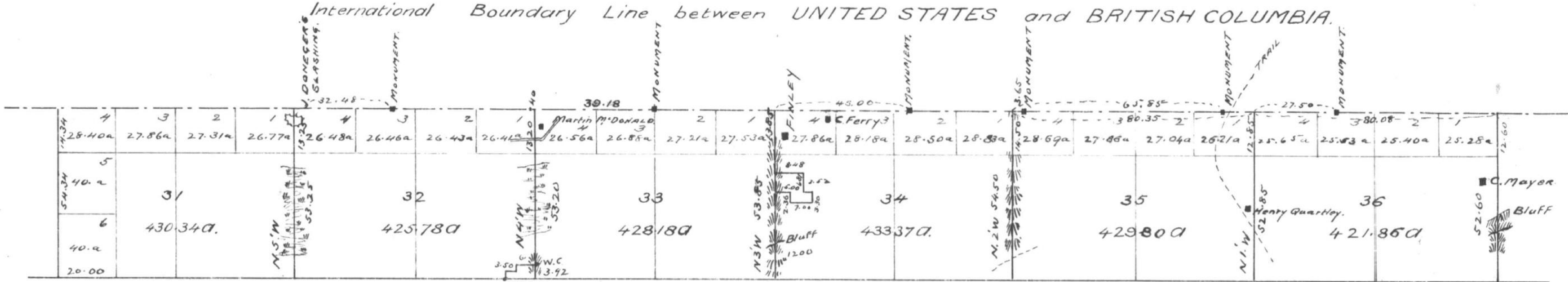
—THE 1998 DNR SURVEY ACCEPTS THE 1966 CLALLAM COUNTY COURT CAUSE NO. 15982 AND J.U. WRIGHT'S PLS 4233 SUBDIVISION, WHICH CALCULATES THE EAST QUARTER CORNER OF SECTION 20 UTILIZING FIELD TIES TO THE NORTHEAST AND SOUTHEAST CORNERS FOR WORK PERFORMED IN SECTION 20 TOWNSHIP 30 NORTH, RANGE 8 WEST, W.M.

—SEE ALSO SURVEY VOLUME 29, PAGE 100 BY R.L. NESARY, PLS 22344.



Smuggler Pass – Along the International Boundary
Sections 33 and 34, T41N, R5E, Willamette Meridian

Township N^o 41 North Range N^o 5 East Willamette Meridian Washington.



Total Number of Acres 2569.33
Tenth Standard Parallel North.

Surveys designated	By Whom Surveyed	Contract No.	Amount of Surveys			When Surveyed	Mean Declination
			Ms.	Chs	Lks.		
Township lines	Isaac M. Galbraith	369, May 25 th 1897	52	60		Jan 10 th 1892 to	22° 28' E.
Subdivisions			3	27	65	July 19 th 1893.	
Connecting lines			3	37	09.		

The above Map of Township N^o 41 North Range N^o 5 East Willamette Meridian Washington is strictly conformable with the field notes of the ^{amended} survey thereof on file in this office, which have been examined and approved.

SURVEYOR GENERAL'S OFFICE,

Olympia Wash. Augst 25th 1893.

Amos T. Shaw

Sur^r Gen^l.

WASHINGTON.

Smuggler Pass – Along the International Boundary

Sections 33 and 34, T41N, R5E, Willamette Meridian

Section 5-31 of the 1973 Manual of Surveying Instructions states that in the restoration of lost corners “proper adjustment is made on an east west line to secure the latitudinal curve.”

The treaty of 15 June 1846 between the United States and Britain established the 49th parallel to be the international boundary from the summit of the Rocky Mountains to the channel separating the continent from Vancouver Island. Subsequent treaties in 1908 and 1925 first agreed to the boundary along the 49th parallel east of the Rocky Mountains to be a line between boundary monuments following the latitudinal curve and later agreed to the boundary being a straight line connecting boundary monuments. That status of the boundary between boundary monuments west of the Rocky Mountains seems never to have been specified by treaty. The 1869 agreement of the Boundary Commissioners, on the right, was that the boundary would be a straight line connecting boundary monuments no matter how far apart the boundary monuments happen to be.

Accordingly a cadastral survey against the international boundary must not offset to the latitudinal curve but must amend closing corners to fall on the straight line between international boundary monuments.

The fourth and final joint conference of the Commissioners was held in Washington, May 4 to 7, 1869. At this meeting the work of the Joint Commission was brought to a close.

The text of the minutes of this meeting as submitted by Colonel Hawkins to his Government are here given in full:

WASHINGTON, D. C., 1869.

Meetings of the Commission on the part of Great Britain to ascertain and mark out so much of the line of Boundary between the British Possessions and the United States described in the First Article of the Treaty between Her Britannic Majesty and the United States of America dated 15th June 1846 as lies between the Rocky or Stony Mountains and the Eastern shore of the Channel which separates the Continent of North America from Vancouver's Island, and the Commission on the part of the United States to carry into effect the first Article of the Treaty aforesaid, held at the office of the United States Boundary Commission, Washington, District of Columbia, U. S. on the 4th, 5th, 6th, and 7th May 1869.

Present:

John Summerfield Hawkins, Colonel Rl. Engrs. Her Majesty's Commissioner for ascertaining and marking out the line of Boundary from the point on the Forty-ninth Parallel of North Latitude where the Boundary laid down in existing Treaties and Conventions between Great Britain and the United States terminates, to the point at which the Forty-ninth Parallel of North Latitude strikes the eastern shore of the Channel which separates the Continent from Vancouver's Island.

Samuel Anderson, Lieut. Royal Engineers, Secretary to the British Commission.

Archibald Campbell, Commissioner on the part of the United States to carry into effect the first Article of the Treaty of the 15th June 1846 between the United States and Great Britain.

John G. Parke, Major U. S. Engineers and Brevet Major General U. S. A.—Chief Astronomer and Surveyor on the part of the United States to carry into effect the first Article of the Treaty as aforesaid.

William J. Warren—Secretary to the United States Commission.

Robert Wolseley Haig, Captain Royal Artillery, Chief Astronomer to the British Commission—was unable to attend the meetings of the joint Commission on account of serious illness.

1. The astronomical and geodetical determinations of the several astronomical stations, and of the points on the Forty-ninth Parallel of North Latitude by which the Boundary has been defined between its western terminus at Point Roberts in West Longitude 123°3'53'' and its eastern terminus on the watershed of the Rocky Mountains in west longitude 114°3'28'' agreed upon and exchanged in May 1863 between Captain R. W. Haig, R. A. Chief Astronomer of the British Commission and G. Clinton Gardner, Assistant Astronomer and Surveyor to the United States Commission having been carefully compared and corrected are finally adopted; and lists of them are countersigned (2) and hereunto attached.

2. The two sets of seven Maps prepared severally by the respective Commissions upon the above named data on a scale of 1:120,000 having been carefully compared and countersigned, are hereby declared to represent so much of the Boundary described in the First Article of the Treaty between Her Britannic Majesty and the United States of America dated 15th June 1846 as is comprised between the intersection of the watershed of the Rocky Mountains by the Forty-ninth Parallel of North Latitude in west longitude 114°3'28'' and the point at which the 49th parallel of north latitude strikes the Eastern shore of the Channel which separates the Continent from Vancouver's Island in West Longitude 123°3'53''.

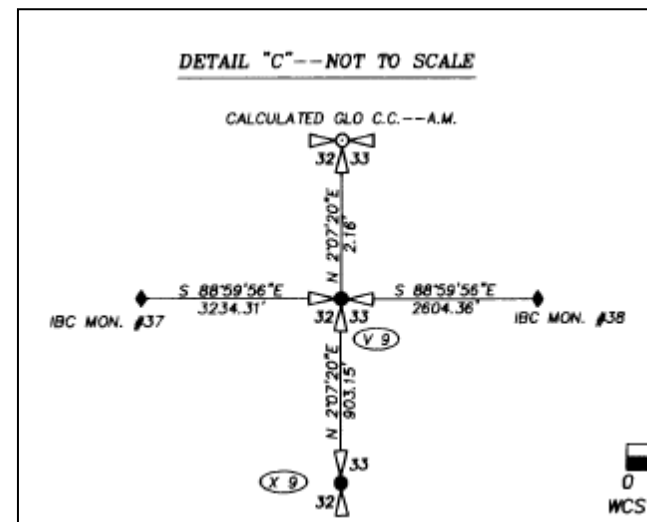
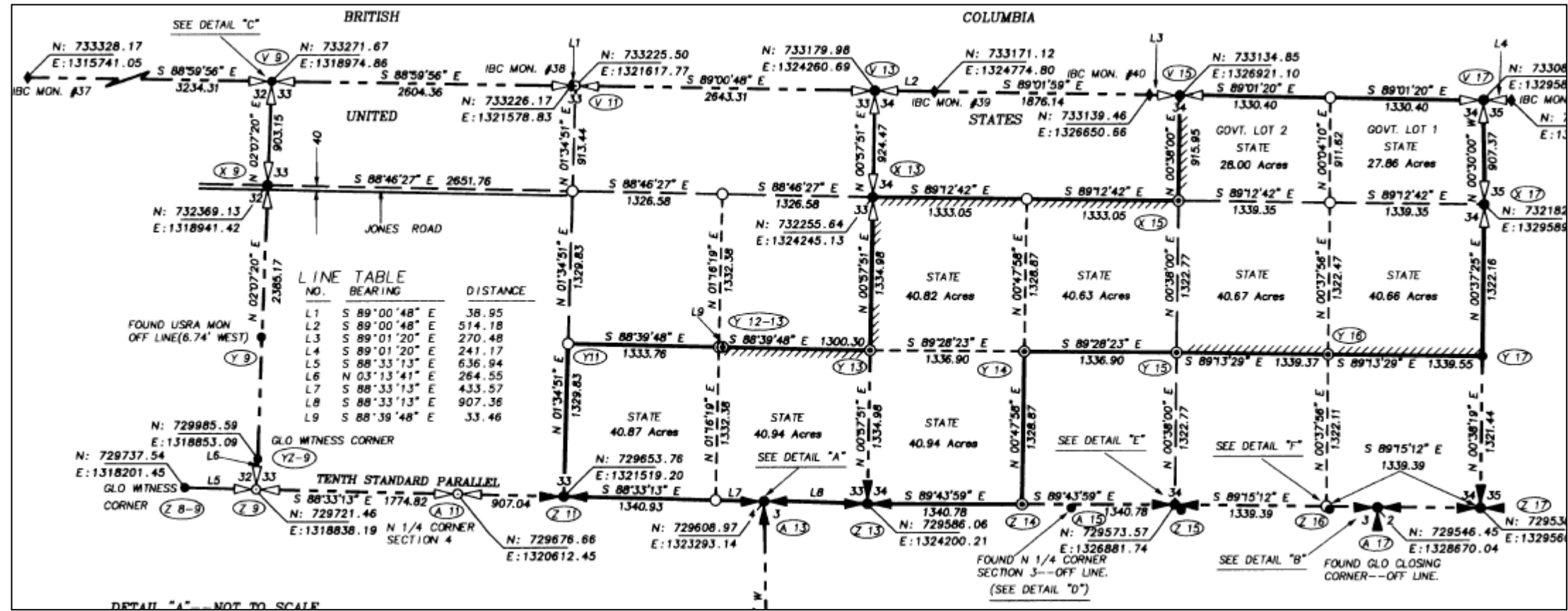
3. It is agreed by the Commissioners that, between any two successive defined points, marked on the ground shown on the maps, and set forth in the accompanying lists, the line of Boundary above described is to be understood to be a right or straight line; and that this rule is to apply throughout the entire Boundary without regard to the distances between the consecutive points or to the course of the parallel in such intervals.

J. S. HAWKINS,
Colonel Rl. Engrs.,
H. B. M. Commissioner,
7th May, 1869.

ARCHIBALD CAMPBELL,
U. S. Commissioner,
&c. &c. &c.
May 7th, 1869.

Smuggler Pass – Along the International Boundary

Sections 33 and 34, T41N, R5E, Willamette Meridian



CORNER PERPETUATION:
 WE CALCULATED A POSITION FOR THE AMENDED MONUMENT CLOSING CORNER (NOT SET) AT RECORD BEARING AND DISTANCE FROM THE CENTER OF THE 76" COTTONWOOD TREE. OUR MONUMENT WAS SET AS THE TRUE CLOSING CORNER AT THE CALCULATED INTERSECTION OF THE INTERNATIONAL BOUNDARY LINE WITH A LINE RUN TRUE SOUTH FROM THE AMENDED CLOSING CORNER. SAID TRUE CLOSING CORNER IS A DNR ALUMINUM MONUMENT, MARKED WITH IDENTIFICATION, 1" UP. REFERENCES WERE ESTABLISHED AS FOLLOWS:
 4" CYPRESS IN TALL HEDGE BEARS N84°W 4.40 FEET. SET ALUMINUM NAIL 1/2 FOOT UP ON SOUTH SIDE.
 6" DIAMETER, 5 FEET TALL CYLINDRICAL WOOD POST WITH FINISH NAIL IN TOP BEARS N78°W 38.94 FEET.
 SET ORANGE CARSONITE POST 1/2 FOOT SOUTH.
 FIELD BOOK 7039A, PAGE 18, 7-25-02.

TEVOR Survey – Completion Survey Calculations

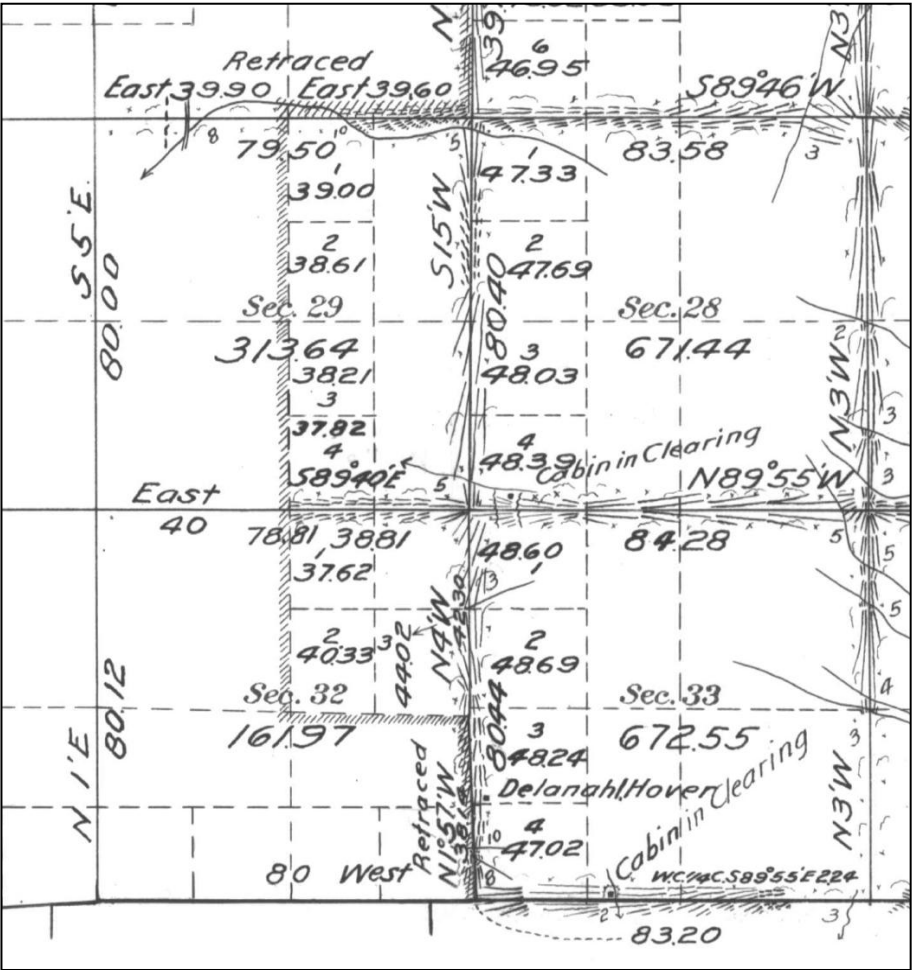
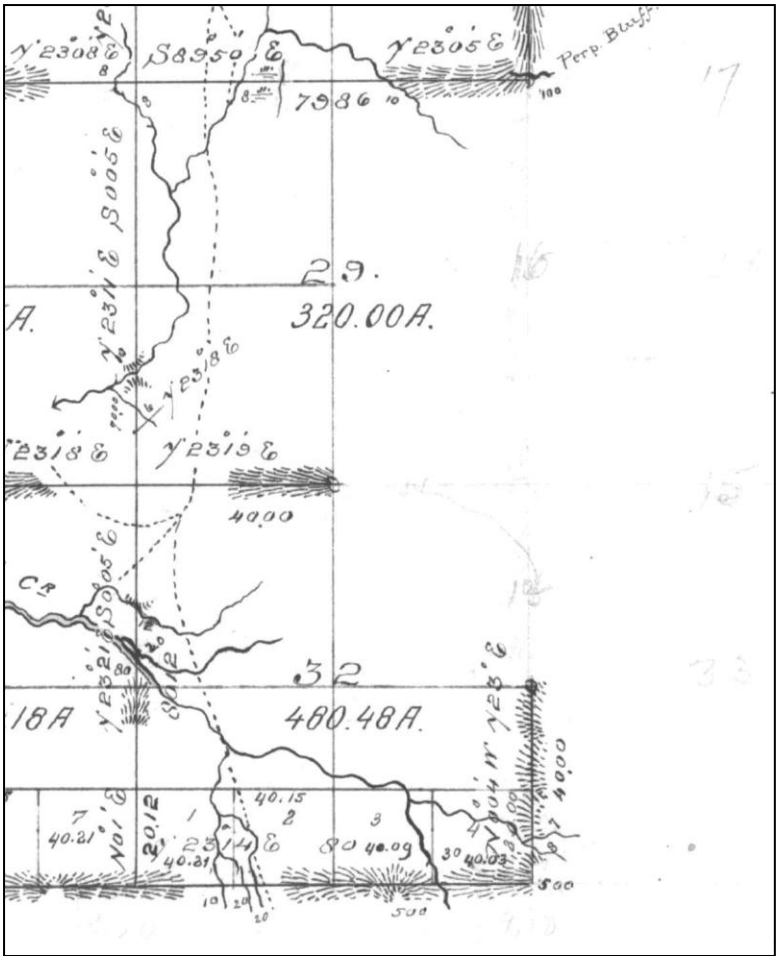
Sections 29 and 32, T32N, R7E, Willamette Meridian

In 1890 George James surveyed a portion of T32N, R7E, creating the west half of section 29 and section 32 except the northeast quarter. In 1906 Charles Campbell and John Penland completed the surveys of sections 29 and 32. The completion survey retraced the north line of section 29 and the south half of the east line of section 32. The corner of sections 28, 29, 32, and 33 was set at an intersection of a line from the east quarter corner of section 32 on a bearing parallel to the east line of the township and a line from the corner of sections 27, 28, 33, and 34 on a bearing parallel to the south line of section 33. The completed areas of sections 29 and 32 have irregular dimensions (were out of limits) and, as a consequence, have lots containing irregular acreage.

Total Number of Acres: 15770.15

SURVEYS DESIGNATED	BY WHOM SURVEYED	CONTRACT		AMOUNT OF SURVEYS			WHEN SURVEYED	BEAR DECLINATION
		N2	DATE	Mls	chs	Lks		
	George James	343	June 10 th 1890				Commenced:	22° 57' E - 23° 18' E
Township Lines	"	"	"	3	01	04	Oct. 6 th 1890	"
Subdivisional	"	"	"	42	14	66	Completed:	"
Connecting Lines	"	"	"	0	20	91	Nov. 8 th 1890	"
Meander Lines	"	"	"	20	69	84	"	"

Surveys Designated.	By Whom Surveyed.	Contract		Amount of Surveys			When Surveyed.	
		No.	Date	Mls.	chs.	Lks.	Began.	Completed.
South and East Bdrs.	Charles L. Campbell	634	Feb. 27, 1906	6	03	20	July 24, 1906	July 27, 1906
Subdivisions	John R. Penland	"	"	17	64	62	" 27 "	Aug. 1, "
Retrace East Bdy.	"	633	"		79	80	Aug. 2, "	" 2, "
" Subdivisions	"	633	"	7	58	96	Aug. 3, "	" 5, "
Connections	"	634	"		7	16	July 29 "	July 31 "



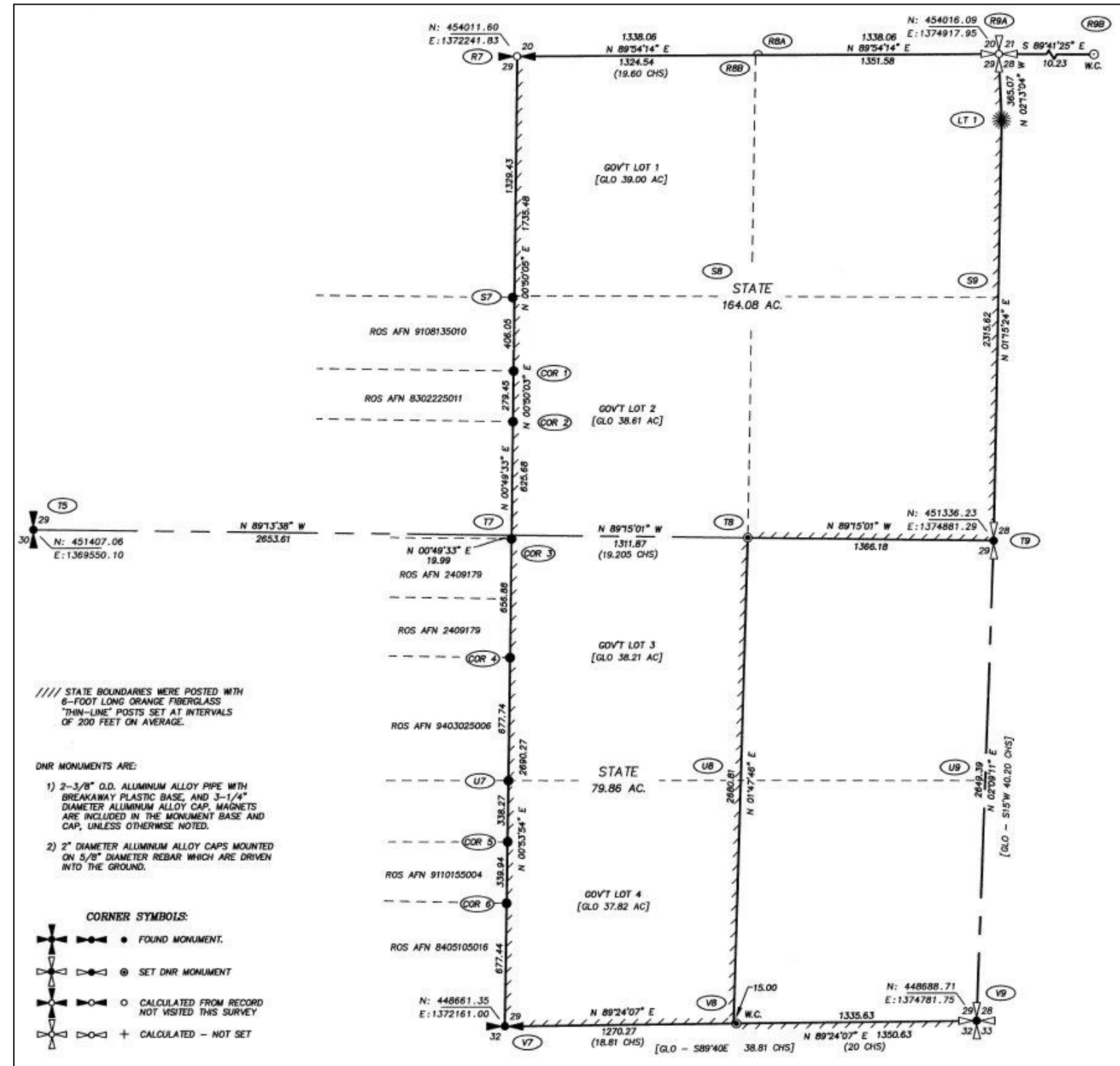
TEVOR Survey – Completion Survey Calculations

Sections 29 and 32, T32N, R7E, Willamette Meridian

The final survey map is on this and the following page. There are several interesting aspects to this survey but this case will concentrate on two issues:

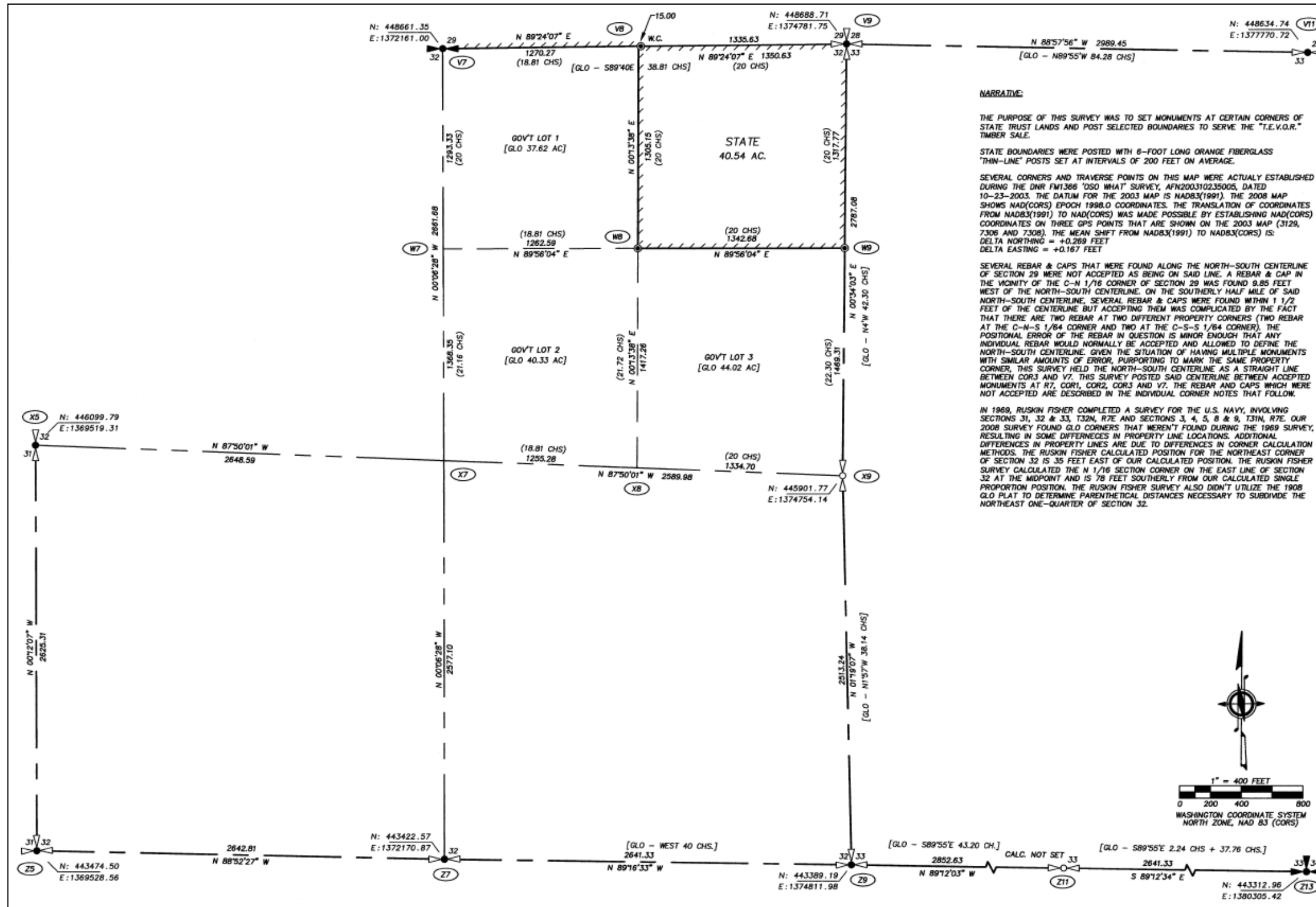
1. The state owns lots 1 – 4 in section 29 and the NE NE ¼ section 32. What are the parentheses used to calculate the lot corners?

2. All the corners along the east line of section 32 are lost. The corners to control the restoration are the 1/4 corner of sections 28 and 29, the 1/4 corner of sections 29 and 32, the 1/4 corner of sections 28 and 33, the south 1/4 corner of section 32 and the southeast corner of section 33. How are the three missing corners calculated?



TEVOR Survey – Completion Survey Calculations

Sections 29 and 32, T32N, R7E, Willamette Meridian



TEVOR Survey – Completion Survey Calculations

Sections 29 and 32, T32N, R7E, Willamette Meridian

Section 29 has a single center 1/4 corner because the survey of the east section line was within rectangular limits for distance.

The parenthesisals in section 29 are straightforward. The north side of lot 1 is 19.60 chains and the south side of lot 4 is 18.81 chains. With the parenthesisal distance between lots 2 and 3 we can subdivide the section. Summing the adjoining lot acreages and dividing by 4 is $(38.61 + 38.21) / 4 = 19.205$ chains. Meaning the north and south section lines is $(19.60 + 18.81) / 2 = 19.205$. Starting from the north and working south gives $39.00 - 19.60 = 19.40$ for the south line of lot 1, and then $38.61 - 19.40 = 19.21$ for the south line of lot 2. Starting from the south and working north gives $37.82 - 18.81 = 19.01$ for the north line of lot 4, and then $38.21 - 19.01 = 19.20$ for the north line of lot 3. Meaning the two answers give 19.205 chains. All three methods give the same answer.

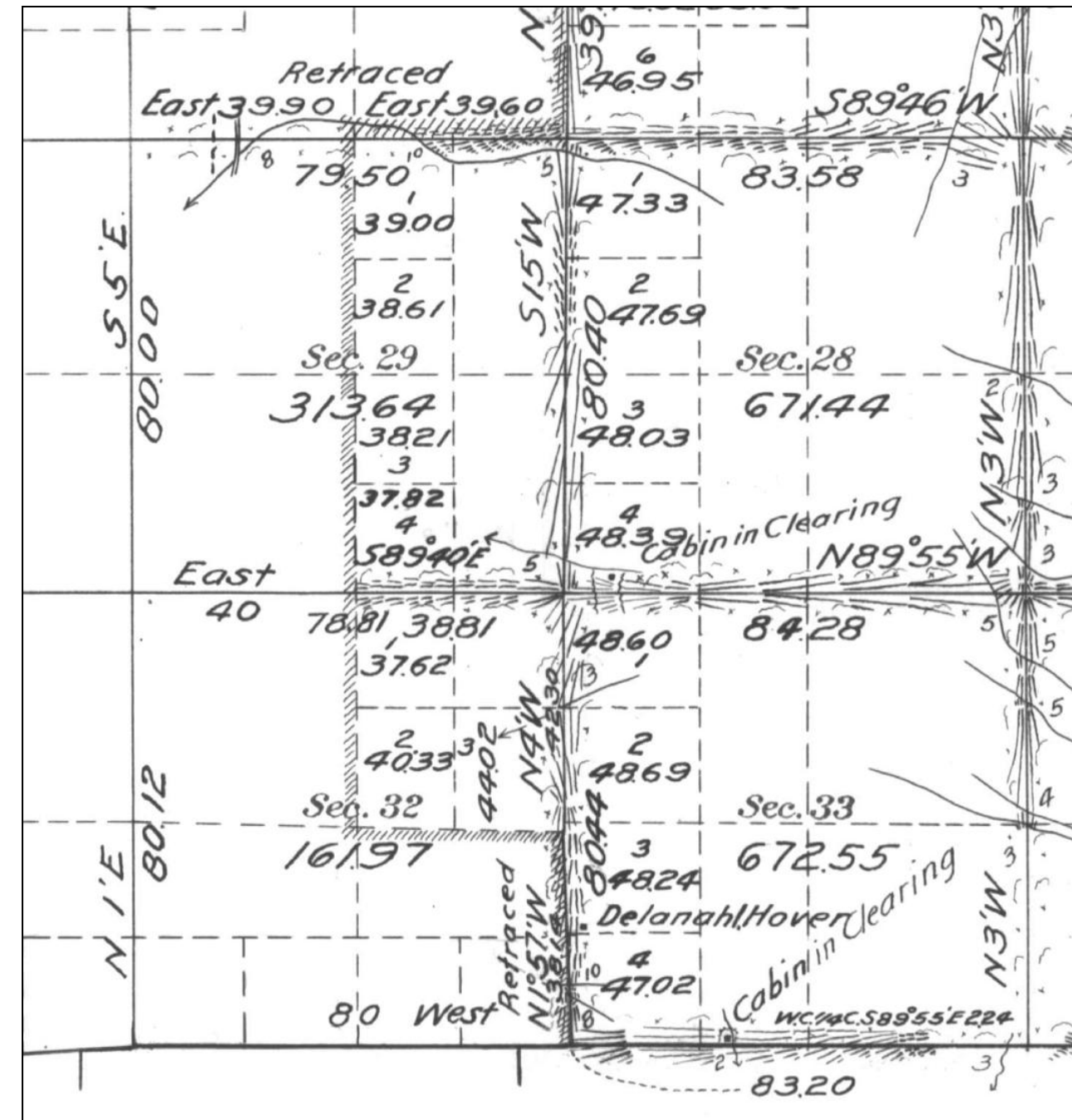
The parenthesisals in section 32 are a little less obvious. The east line of lot 3 is 22.30 chains because that is where the excess distance along the section line was put to create the lot. The west line of lot 1 is 20 chains because the east line is 20 chains and the south line of lot 1 together with the south line of the NE1/4 NE1/4 make a straight line. The south line of lot 1 is $37.62 - 18.81 = 18.81$ chains. Since the east line of lot 1 and the east line of lot 2 make a straight line we know that the south line of lot 2 is 18.81 chains and the south line of lot 3 is 20 chains. The east line of lot 2 is $44.02 - 22.30 = 21.72$ chains. The last missing parenthesisal is the west line of lot 2. Fortunately the distance can be solved as the one unknown in the equation for acreage of lots with sides of irregular distance. Multiply the mean of the north and south lines times the mean of the east and west line and divide by ten.

$$18.81 * [(21.72 + X) / 2] = 10 * 40.33$$

$$(21.72 + X) / 2 = 400.30 / 18.81 = 21.4407$$

$$21.72 + X = 21.4407 * 2 = 42.8814$$

$$X = 42.8814 - 21.72 = 21.16 \text{ chains} = \text{the west line of lot 2}$$



TEVOR Survey – Completion Survey Calculations
Sections 29 and 32, T32N, R7E, Willamette Meridian

The BLM program Cadastral Measurement Management, CMM, can easily calculate modified single proportions, or irregular boundary adjustments. If you calculate such proportions manually, you will need to use true bearings for each course because latitude and departure corrections are based on true astronomic latitude and departures. With CMM you can use state plane coordinates and CMM will do the calculations with true bearings.

The first calculation to make is to restore the standard corner of sections 32 and 33, corner Z9. After entering the controlling corner coordinates into CMM the record courses and distances are entered from the federal plat. You can switch CMM to use chains for this step of the calculations. Then CMM computes the misclosure and the adjusted courses.

East-West Modified Single Proportion
Irregular Boundary Adjustment
At Elevation: 1500.00 ft.

Z7
(forward) N. 89ø59'45" E. Dist. at mean elevation: 1500.00 ft.
(mean) East 40.0000 ch. (40.00 ch) (2640.00 ft)
(reverse) N. 89ø59'45" W. Lat: 0.0000 Dep: 40.0000

Z9
(forward) S. 89ø55'16" E. Dist. at mean elevation: 1500.00 ft.
(mean) S. 89ø55'00" E. 43.2000 ch. (43.20 ch) (2851.20 ft)
(reverse) N. 89ø54'44" W. Lat: -0.0628 Dep: 43.2000

Z11
(forward) S. 89ø55'15" E. Dist. at mean elevation: 1500.00 ft.
(mean) S. 89ø55'00" E. 40.0000 ch. (40.00 ch) (2640.00 ft)
(reverse) N. 89ø54'45" W. Lat: -0.0582 Dep: 40.0000

Z13

Report of Record Traverse Misclosure

Mean Geodetic Bearing to Closing Station: N. 21ø41'36" E.
Ground Distance to Closing Station: 0.2106 ch. at 1500.00 ft. Elev.
Error in Latitude: 0ø00'00.1274"
Error in Longitude: 0ø00'00.0759"
Error in State Plane Northing: -0.1946 ch.
Error in State Plane Easting: -0.0805 ch.

Adjusted Courses

Z7
(forward) N. 89ø54'18" E. Dist. at mean elevation: 1500.00 ft.
(mean) N. 89ø54'33" E. 40.0253 ch. (40.03 ch) (2641.67 ft)
(reverse) S. 89ø54'47" W. Lat: 0.0635 Dep: 40.0253

Z9
(forward) N. 89ø59'17" E. Dist. at mean elevation: 1500.00 ft.
(mean) N. 89ø59'32" E. 43.2272 ch. (43.23 ch) (2853.00 ft)
(reverse) S. 89ø59'48" W. Lat: 0.0058 Dep: 43.2272

Z11
(forward) N. 89ø59'18" E. Dist. at mean elevation: 1500.00 ft.
(mean) N. 89ø59'32" E. 40.0252 ch. (40.03 ch) (2641.67 ft)
(reverse) S. 89ø59'47" W. Lat: 0.0054 Dep: 40.0252

Z13

Then list the state plane coordinates and inverses in CMM.

List Plane Coordinates:

Point ID	Northing (ft.)	Easting (ft.)	Elevation (ft.)
Z7	443422.5700	1372170.8700	1500.0000
Z13	443312.9600	1380305.4200	1500.0000
Z9	443389.1886	1374811.9904	1500.0000
Z11	443349.4079	1377664.3450	1500.0000

Inverse:

Z7
S. 89ø16'33" E. 2641.3313 ft. (40.020 ch)
Lat: -33.3814 Dep: 2641.1204

Z9
Inverse:
Z9
S. 89ø12'03" E. 2852.6320 ft. (43.222 ch)
Lat: -39.7807 Dep: 2852.3546

Z11
Inverse:
Z11
S. 89ø12'34" E. 2641.3265 ft. (40.020 ch)
Lat: -36.4479 Dep: 2641.0750

Z13

Note that an average project elevation was used in CMM to allow the plat record ground distances to be correctly calculated with reference to the state plane coordinates.

TEVOR Survey – Completion Survey Calculations

Sections 29 and 32, T32N, R7E, Willamette Meridian

Next compute the double proportion for the corner of sections 28, 29, 32, and 33, corner V9. After entering the control coordinates enter the record bearings and distances from the control to the proportioned corners. The double proportion latitude and longitude will be computed.

Double Proportion

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Double Proportionment Adjustment

At Elevation: 1500.00 ft.

T9

(forward) S. 0ø15'00" W. Dist. at mean elevation: 1500.00 ft.

(mean) S. 0ø15'00" W. 40.2000 ch. (40.20 ch) (2653.20 ft)

(reverse) N. 0ø15'00" E. Lat: -40.1996 Dep: -0.1754

V9

Z9

(forward) N. 1ø57'00" W. Dist. at mean elevation: 1500.00 ft.

(mean) N. 1ø57'00" W. 38.1400 ch. (38.14 ch) (2517.24 ft)

(reverse) S. 1ø57'00" E. Lat: 38.1179 Dep: -1.2978

X9

(forward) N. 0ø04'00" W. Dist. at mean elevation: 1500.00 ft.

(mean) N. 0ø04'00" W. 42.3000 ch. (42.30 ch) (2791.80 ft)

(reverse) S. 0ø04'00" E. Lat: 42.3000 Dep: -0.0492

V9

V11

(forward) N. 89ø54'44" W. Dist. at mean elevation: 1500.00 ft.

(mean) N. 89ø55'00" W. 44.2800 ch. (44.28 ch) (2922.48 ft)

(reverse) S. 89ø55'16" E. Lat: 0.0644 Dep: -44.2800

V9

V7

(forward) S. 89ø40'14" E. Dist. at mean elevation: 1500.00 ft.

(mean) S. 89ø40'00" E. 38.8100 ch. (38.81 ch) (2561.46 ft)

(reverse) N. 89ø39'46" W. Lat: -0.2258 Dep: 38.8093

V9

Record ä LATs from Z9 to T9: 120.618 ch. 7960.755 ft.

Measured ä LATs from Z9 to T9: 120.428 ch. 7948.242 ft.

Record ä DEPs from V7 to V11: 83.089 ch. 5483.894 ft.

Measured ä DEPs from V7 to V11: 85.004 ch. 5610.252 ft.

Proportioned Position: V9

Latitude: 48ø13'29.6254"

Longitude: 121ø55'23.2951"

Next the adjusted true courses will be listed.

Adjusted Courses

T9

(forward) S. 1ø20'31" W. Dist. at mean elevation: 1500.00 ft.

(mean) S. 1ø20'31" W. 40.1474 ch. (40.15 ch) (2649.73 ft)

(reverse) N. 1ø20'30" E. Lat: -40.1364 Dep: -0.9402

V9

Z9

(forward) N. 1ø08'17" W. Dist. at mean elevation: 1500.00 ft.

(mean) N. 1ø08'17" W. 80.3073 ch. (80.31 ch) (5300.28 ft)

(reverse) S. 1ø08'18" E. Lat: 80.2915 Dep: -1.5952

V9

V11

(forward) N. 89ø46'04" W. Dist. at mean elevation: 1500.00 ft.

(mean) N. 89ø46'21" W. 45.3006 ch. (45.30 ch) (2989.84 ft)

(reverse) S. 89ø46'37" E. Lat: 0.1799 Dep: -45.3002

V9

V7

(forward) N. 88ø34'57" E. Dist. at mean elevation: 1500.00 ft.

(mean) N. 88ø35'12" E. 39.7156 ch. (39.72 ch) (2621.23 ft)

(reverse) S. 88ø35'26" W. Lat: 0.9797 Dep: 39.7035

V9

Then list the state plane coordinates and inverses. Note that X9, the 1/4 corner of sections 32 and 33 on an irregular boundary is not properly calculated during the double proportion.

Z7	443422.5700	1372170.8700	1500.0000
Z13	443312.9600	1380305.4200	1500.0000
Z9	443389.1886	1374811.9904	1500.0000
Z11	443349.4079	1377664.3450	1500.0000
T9	451336.2300	1374881.2900	1500.0000
V7	448661.3500	1372161.0000	1500.0000
V11	448634.7400	1377770.7200	1500.0000
X9	445905.6090	1374761.9675	1500.0000
V9	448688.7076	1374781.7504	1500.0000

Inverse:

V9 to T9

N. 2ø09'11" E. 2649.3929 ft. (40.142 ch)

Lat: 2647.5224 Dep: 99.5396

V9 to X9

S. 0ø24'26" W. 2783.1689 ft. (42.169 ch)

Lat: -2783.0986 Dep: -19.7829

X9 to Z9

S. 1ø08'20" E. 2516.9175 ft. (38.135 ch)

Lat: -2516.4204 Dep: 50.0229

V9 to V11

S. 88ø57'56" E. 2989.4568 ft. (45.295 ch)

Lat: -53.9676 Dep: 2988.9696

V9 to V7

S. 89ø24'07" W. 2620.8932 ft. (39.711 ch)

Lat: -27.3576 Dep: -2620.7504

TEVOR Survey – Completion Survey Calculations

Sections 29 and 32, T32N, R7E, Willamette Meridian

Next calculate the irregular boundary adjustment between the southeast and northeast corners of section 32. As before, enter the record courses and distances and CMM will compute the error of closure and the adjusted courses.

Irregular Boundary Adjustment
At Elevation: 1500.00 ft.
Z9
 (forward) N. 1ø57'00" W. Dist. at mean elevation: 1500.00 ft.
 (mean) N. 1ø57'00" W. 38.1400 ch. (38.14 ch) (2517.24 ft)
 (reverse) S. 1ø57'00" E. Lat: 38.1179 Dep: -1.2978
X9-FIX
 (forward) N. 0ø04'00" W. Dist. at mean elevation: 1500.00 ft.
 (mean) N. 0ø04'00" W. 42.3000 ch. (42.30 ch) (2791.80 ft)
 (reverse) S. 0ø04'00" E. Lat: 42.3000 Dep: -0.0492
V9

Report of Record Traverse Misclosure

Mean Geodetic Bearing to Closing Station: S. 63ø00'43" W.
Ground Distance to Closing Station: 0.2785 ch. at 1500.00 ft. Elev.
Error in Latitude: 0ø00'00.0823"
Error in Longitude: 0ø00'00.2419"
Error in State Plane Northing: 0.1229 ch.
Error in State Plane Easting: 0.2499 ch.

Adjusted Courses
Z9
 (forward) N. 2ø07'48" W. Dist. at mean elevation: 1500.00 ft.
 (mean) N. 2ø07'48" W. 38.0843 ch. (38.08 ch) (2513.56 ft)
 (reverse) S. 2ø07'49" E. Lat: 38.0580 Dep: -1.4155
X9-FIX
 (forward) N. 0ø14'38" W. Dist. at mean elevation: 1500.00 ft.
 (mean) N. 0ø14'38" W. 42.2339 ch. (42.23 ch) (2787.44 ft)
 (reverse) S. 0ø14'38" E. Lat: 42.2335 Dep: -0.1798
V9

Then list the state plane coordinates and inverses in CMM.

List Plane Coordinates:
Point ID Northing (ft.) Easting (ft.) Elevation (ft.)

Z7 443422.5700 1372170.8700 1500.0000
Z13 443312.9600 1380305.4200 1500.0000
Z9 443389.1886 1374811.9904 1500.0000
Z11 443349.4079 1377664.3450 1500.0000
T9 451336.2300 1374881.2900 1500.0000
V7 448661.3500 1372161.0000 1500.0000
V11 448634.7400 1377770.7200 1500.0000
X9 445905.6090 1374761.9675 1500.0000
V9 448688.7076 1374781.7504 1500.0000
X9-FIX 445901.7646 1374754.1461 1500.0000
Inverse:
Z9
 N. 1ø19'08" W. 2513.2418 ft. (38.079 ch)
 Lat: 2512.5760 Dep: -57.8443

X9-FIX
Inverse:
X9-FIX
 N. 0ø34'03" E. 2787.0797 ft. (42.228 ch)
 Lat: 2786.9430 Dep: 27.6043

V9

Notice that the correct coordinate for the east 1/4 corner of section 32, X9-FIX is about 4 feet south and 8 feet west of the position calculated during the double proportion. It is probable that the coordinate generated during the double proportion is an unadjusted position. Note that corner X9 does not appear on the list of adjusted courses during the double proportion.